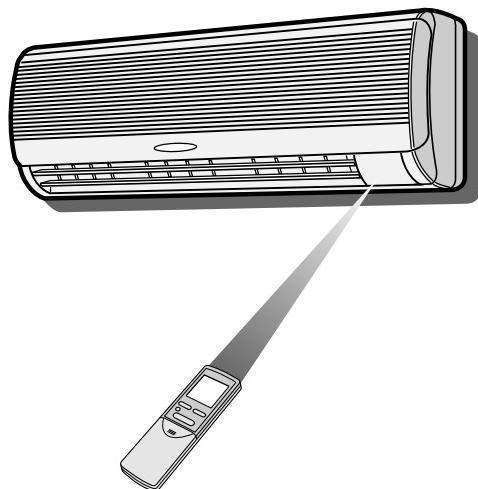


# SHARP SERVICE MANUAL

S2915AYA099E/



## SPLIT SYSTEM ROOM AIR CONDITIONERS

### INDOOR UNIT

**MODELS** **AY-A079E**  
**AY-A099E**  
**OUTDOOR UNIT**  
**AE-A079E**  
**AE-A099E**

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

### TABLE OF CONTENTS

	Page
SPECIFICATIONS .....	2
EXTERNAL DIMENSIONS .....	3
WIRING DIAGRAMS .....	4
ELECTRICAL PARTS .....	5
MICROCOMPUTER CONTROL SYSTEM .....	8
FUNCTIONS .....	9
TROUBLESHOOTING OF THE CONTROL CIRCUIT .....	17
REFRIGERATION CYCLE .....	21
PERFORMANCE CURVES .....	23
REFRIGERANT PIPE INSTALLATION WORKS .....	24
DISASSEMBLING PROCEDURE .....	25
REPLACEMENT PARTS LIST .....	29

**SHARP CORPORATION**

## SPECIFICATIONS

ITEMS	INDOOR UNIT	OUTDOOR UNIT	INDOOR UNIT	OUTDOOR UNIT
	AY-A079E	AE-A079E	AY-A099E	AE-A099E
Cooling capacity	kW	2.1	2.6	
Heatpump	kW	2.4	3.0	
Heating capacity				
Moisture removal	Liters/h	0.9	1.2	

★ Electrical data

Phase	—	Single			
Rated frequency	Hz	50			
Rated voltage range	V	198 to 264			
Rated voltage	V	220 - 240			
Rated current	Cool	A	3.2 - 3.1	4.1 - 3.9	
	Heat	A	2.9 - 2.8	4.0 - 3.9	
Rated input	Cool	W	680 - 720	890 - 920	
	Heat	W	630 - 670	880 - 920	
Power factor	Cool	%	97 - 97	99 - 98	
	Heat	%	99 - 99	99 - 98	
Compressor	Type	Hermetically sealed rotary type			
	Model	2PS134D5AA01	RH174VHET		
	Oil charge	270cc (SUNISO 4GID)	300cc (DIAMOND MS56)		
Refrigerant system	Evaporator	Louver fin and Grooved tube type(7mm tube)			
	Condenser	Corrugate Fin and Grooved tube type			
	Control	Capillary tube			
	Refrigerant volume	690g	730g		
	De-Ice system	Micro computer controled reverse sysetm			
Noise level (at cooling)	High	dB(A)	33	43	38
	Med.	dB(A)	29	—	31
	Low	dB(A)	26	—	27

Fan system

Drive	Direct drive				
Air flow quantity (at cooling)	High	m <sup>3</sup> /min.	5.8	20	7.1
	Med.	m <sup>3</sup> /min.	4.9	—	5.3
	Low	m <sup>3</sup> /min.	4.3	—	4.4
Fan		Cross flow fan	Propeller fan	Cross flow fan	Propeller fan

Connections

Refrigerant coupling	Flare type
Refrigerant tube size Gas, Liquid	3/8", 1/4"
Refrigerant pipe sets No.	AZ-24H5E; 5m(16.4ft), AZ-24H7E; 7m(23ft)
Drain piping mm(Inches)	O.D ø 18(45/64)

Others

Safety device	Compressor: Overload protector(MRA98589)		Compressor: Overload protector(Internal)		
	Fan motors: Thermal fuse				
	Fuse, Micro computer control				
Air filters	Polypropylene net (Washable)				
Net dimensions	Width	mm	790	720	790
	Height	mm	270	535	270
	Depth	mm	155	236	155
Net weight		kg	7	27	7
					31

Note: The condition of star ( ★ ) marked item are 'IEC 378'.

## EXTERNAL DIMENSIONS

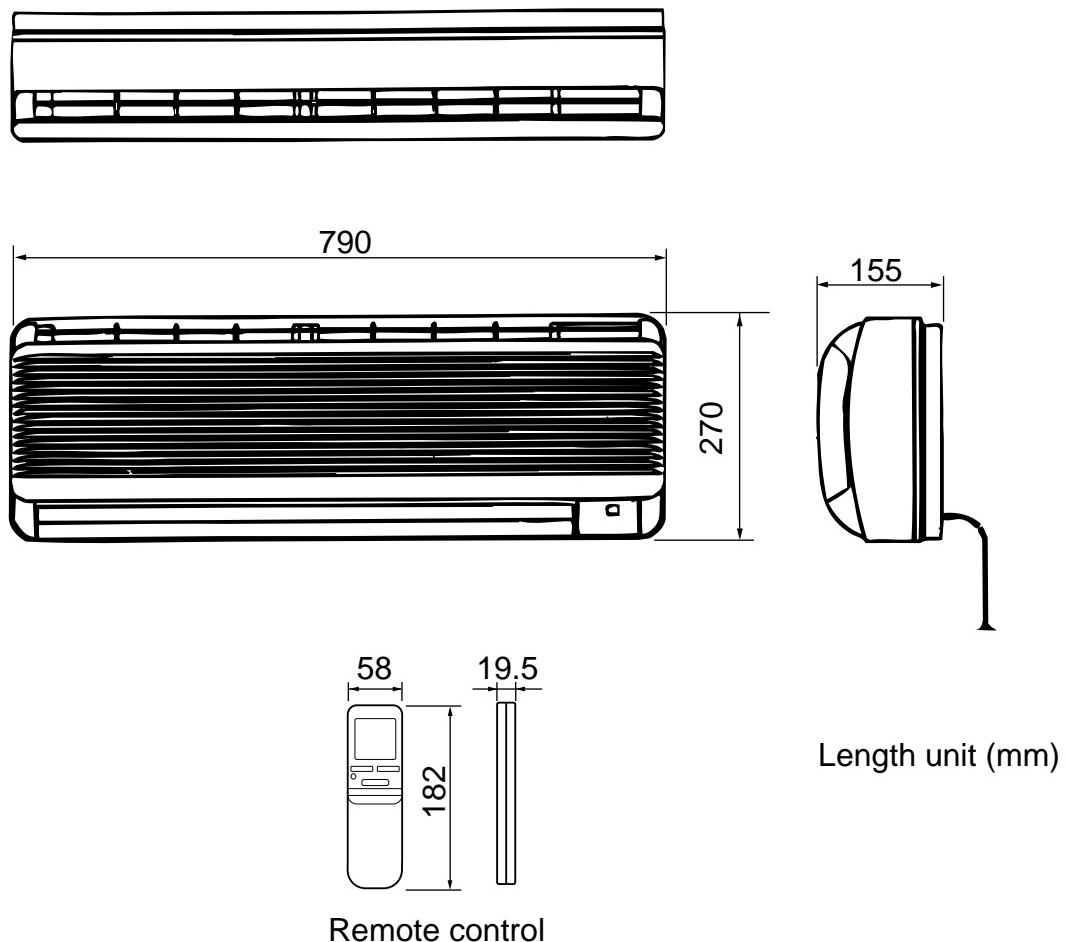


Figure E-1. INDOOR UNIT for AY-A079E and AY-A099E

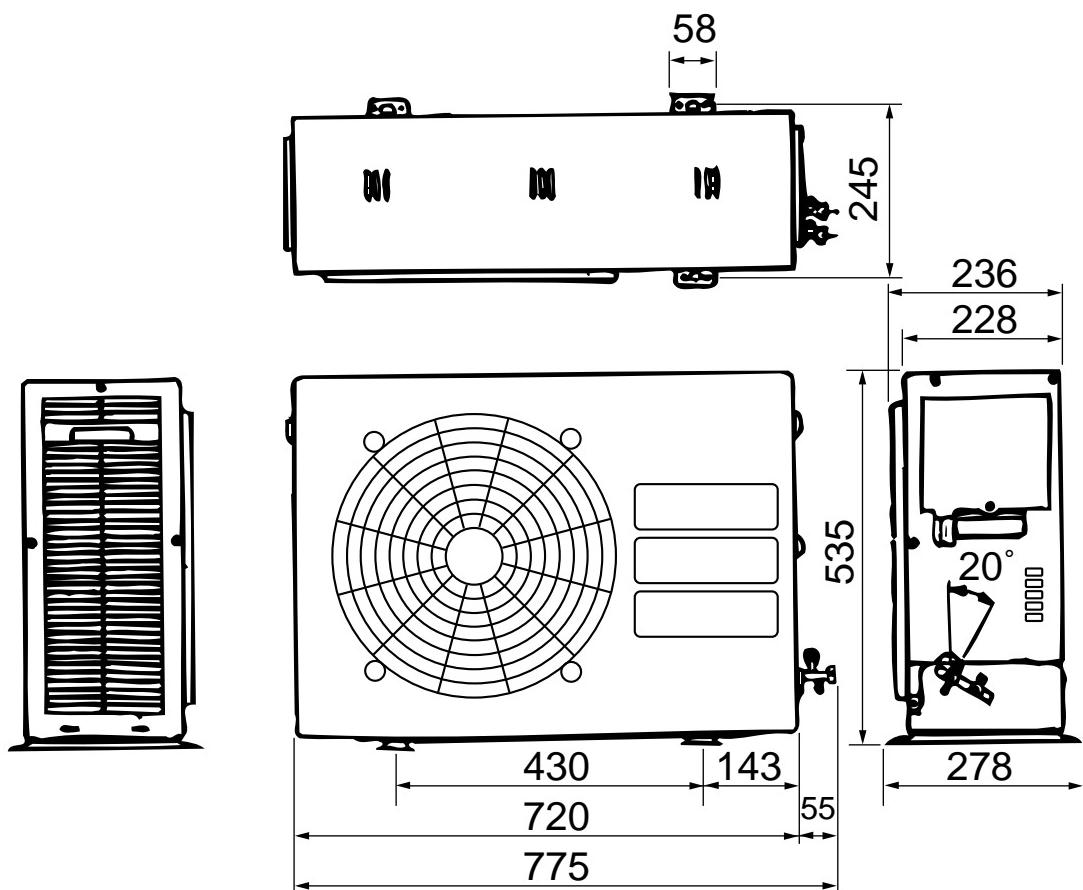


Figure E-2. OUTDOOR UNIT for AE-A079E and AE-E099E

## WIRING DIAGRAMS

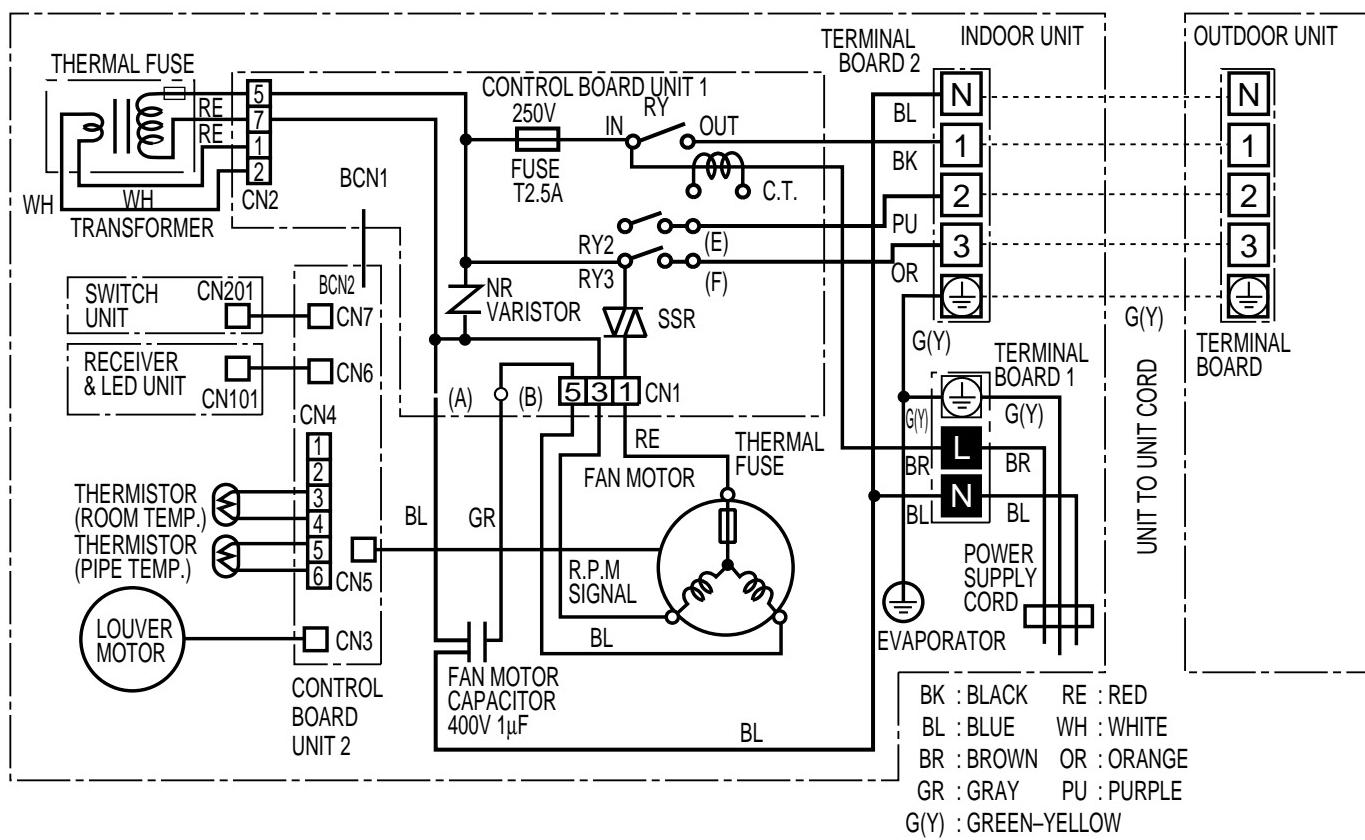


Figure W-1. Wiring Diagram for AY-A079E and AY-A099E

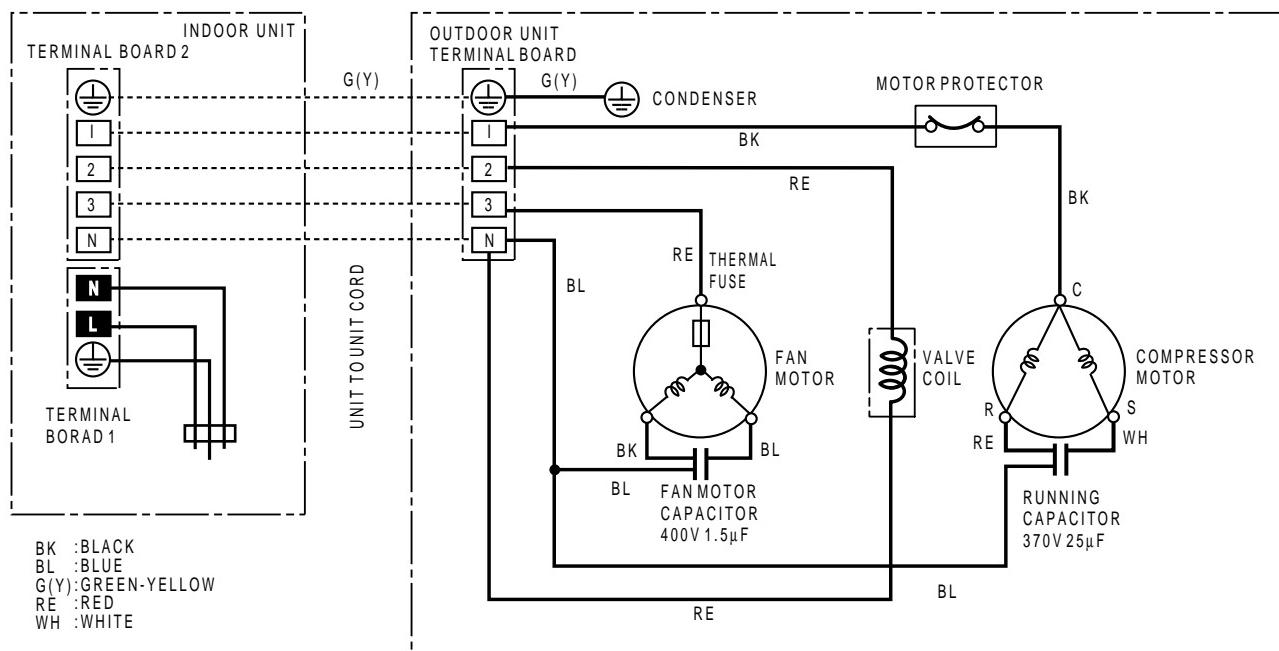


Figure W-2. Wiring Diagram for AE-A079E

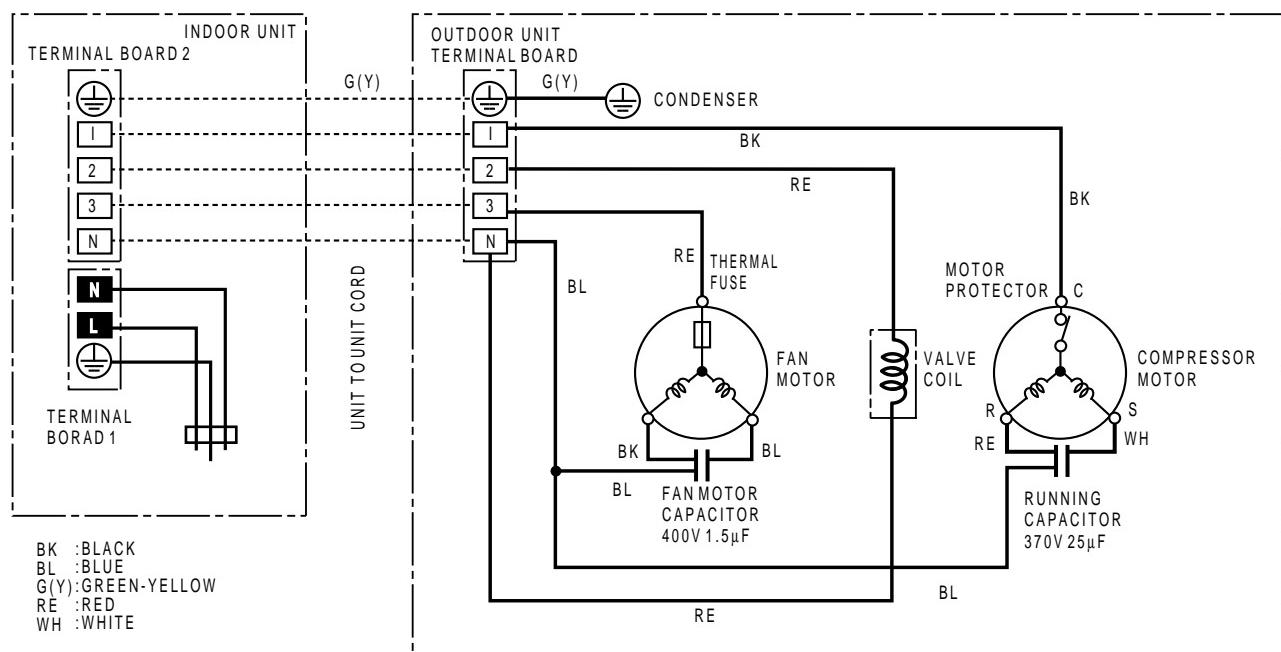


Figure W-3. Wiring Diagram for AE-A099E

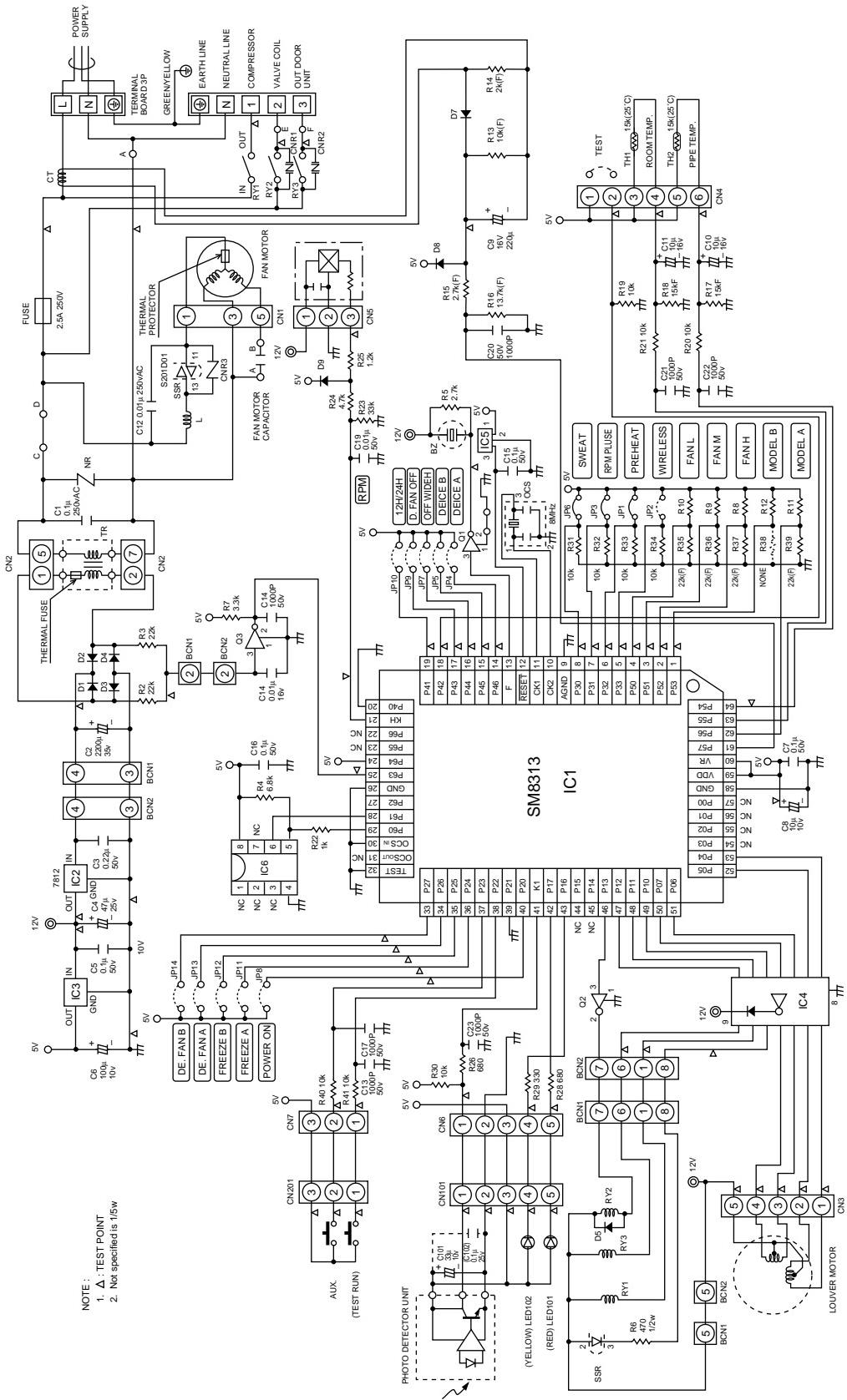
## ELECTRICAL PARTS

### For Model AY-A079E and AE-A079E

DESCRIPTION	MODEL	REMARKS	SITE
Compressor	2PS134D5AA01	220/240V, 50Hz, 650W	AE
Indoor fan motor	ML-A411	220/240V, 50Hz	AY
Outdoor fan motor	ML-A592	220/240V, 50Hz	AE
Indoor fan motor capacitor	—	400V, 1μF	AY
Outdoor fan motor capacitor	—	400V, 1.5μF	AE
Running capacitor	—	370V, 25μF	AE
Transformer	—	Primary; AC 220V,50Hz Secondary; AC16.1V, 50Hz	AY
Fuse		250V, 2.5A	AY
Reverse valve	MMB-26A	240V	AE
Reverse valve coil	RSV-10	—	AE

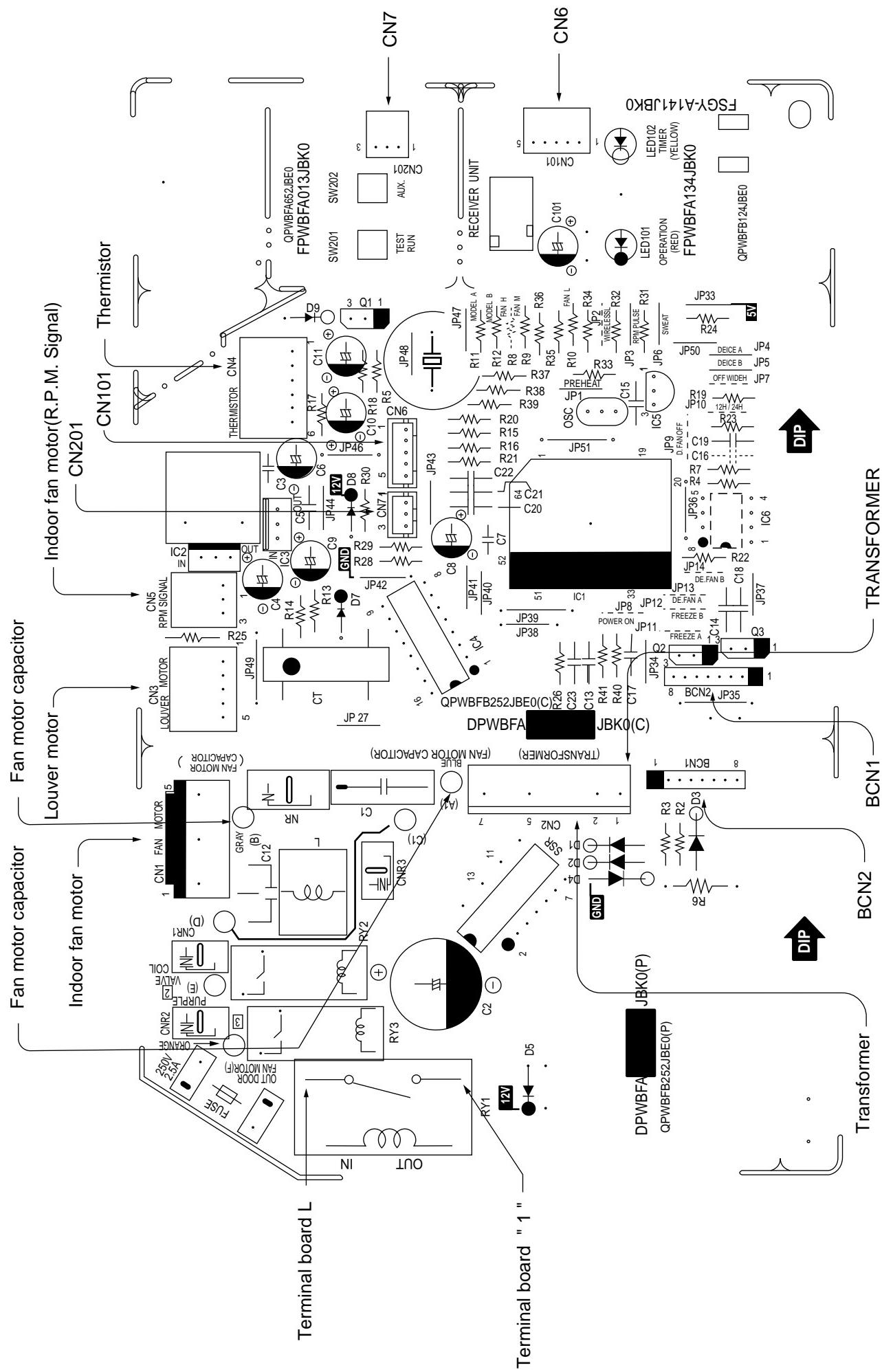
### For Model AY-A099E and AE-A099E

DESCRIPTION	MODEL	REMARKS	SITE
Compressor	RH174VHET	220/240V, 50Hz, 800W	AE
Indoor fan motor	ML-A411	220/240V, 50Hz	AY
Outdoor fan motor	ML-A592	220/240V, 50Hz	AE
Indoor fan motor capacitor	—	400V, 1μF	AY
Outdoor fan motor capacitor	—	400V, 1.5μF	AE
Running capacitor	—	370V, 25μF	AE
Transformer	—	Primary; AC 220V, 50Hz Secondary; AC16.1V, 50Hz	AY
Fuse	—	250V, 2.5A	AY
Reverse valve	MMB-26A	240V	AE
Reverse valve coil	RSV-10	—	AE



FUNCTION	D FA/N OFF	OFF WIDEN	DEVICE B	DEVICE A	SWEAT	RPM	PREHEAT	WIRELESS CHANG/ NORMAL	FAN L	FAN M	MODEL A	MODEL B	DE FAN B	DE FAN A	FREEZE B	FREEZE A	POWER ON/OFF
IC1 PIN NO.	12H / 24H	3.5mm.	16 (P44)	15 (P45)	8 (P30)	7 (P31)	6 (P32)	5 (P50)	3 (P51)	2 (P52)	1 (P53)	64 (P54)	33 (P27)	34 (P26)	35 (P25)	40 (P24)	
SYMBOL	JP10	JP9	JP7	JP5	JP4	JP6	JP3	JP1	JP2	JP10	R9	R8	R12	R11	JP14	JP13	JP8
AY-A079E	X NONE	X NONE	X NONE	X NONE	O USE	O USE	O USE	X NONE	X NONE	140k(F)	24.9k(F)	22.9k(F)	133k(F)	X NONE	X NONE	X NONE	
AY-A039E	X NONE	X NONE	X NONE	O USE	O USE	O USE	O USE	X NONE	14k(F)	15k(F)	15k(F)	1.87k(F)	107k(F)	X NONE	X NONE	X NONE	

**Figure I-1.** Electronic Control Circuit Diagram for AY-A079E and AY-A099E



**Microcomputer (IC1)**

The microcomputer is a CMOS, one chip, 8-bit microcomputer.

Microcomputer port allocation is as follows.

Pin No.	Terminal Name	Input Output	Function
1	P53	IN	MODEL B
2	P52	IN	FAN H
3	P51	IN	FAN M
4	P50	IN	FAN L
5	P33	IN	WIRELESS
6	P32	IN	PREHEAT
7	P31	IN	PRM PLUSE
8	P30	IN	SWEAT
9	AGND	IN	0V
10	CK2	IN	OSILLATION
11	CK1	IN	OSILLATION
12	RESET	IN	RESET
13	F	OUT	BUZZER
14	R46	IN	DEICE A
15	R45	IN	DEICE B
16	R44	IN	COMP. OFF WIDTH
17	R43	IN	DEHUM. FAN OFF
18	R42	IN	TEST 1
19	R41	IN	—
20	R40	IN	—
21	KH	IN	PRM SIGNAL
22	P66	IN	—
23	P65	IN	—
24	P64	IN	—
25	P63	IN	AC CLOCK
26	GND	IN	0V
27	P62	IN	—
28	P61	OUT	EEPROM CLOCK
29	P60	IN	EEPROM DATA
30	OSC	IN	—
31	OSC	OUT	—
32	TEST	IN	—

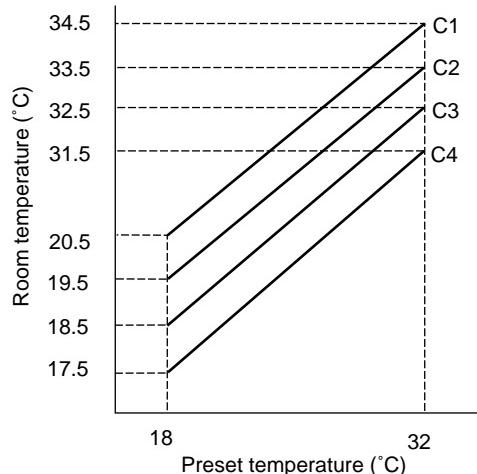
Pin No.	Terminal Name	Input Output	Function
33	P27	IN	MODEL 4
34	P26	IN	MODEL 3
35	P25	IN	MODEL 2
36	P24	IN	MODEL 1
37	P23	IN	SWITCH AUX.
38	P22	IN	SWITCH TEST RUN
39	P21	IN	—
40	P20	IN	POWER ON
41	KI	IN	WIRELESS SIGNAL
42	P17	OUT	LED OPERATION
43	P16	OUT	LED TIMER
44	P15	OUT	—
45	P14	OUT	—
46	P13	OUT	(VALVE COIL)
47	P12	OUT	(OUT DOOR FAN)
48	P11	OUT	RY1
49	P10	OUT	SSR
50	P07	OUT	LOUVER MOTOR
51	P06	OUT	LOUVER MOTOR
52	P05	OUT	LOUVER MOTOR
53	P04	OUT	LOUVER MOTOR
54	P03	OUT	—
55	P02	OUT	—
56	P01	OUT	—
57	P00	OUT	—
58	GND	IN	0V
59	VDD	IN	5V
60	VR	IN	5V
61	P57	IN	(CURRENT LEVEL)
62	P56	IN	TH1
63	P55	IN	TH2
64	P54	IN	MODEL A

## FUNCTIONS

### 1. Temperature control characteristic

#### 1-1 COOL operation

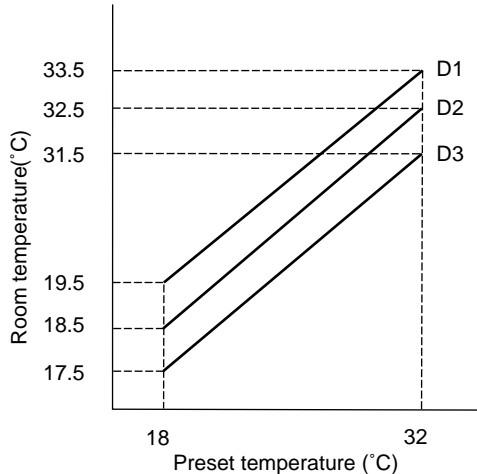
In the "COOL" mode, the thermostat circuit is controlled by four thermostat lines (C1 thru C4).



**Figure Y-1**

#### 1-2 DRY operation

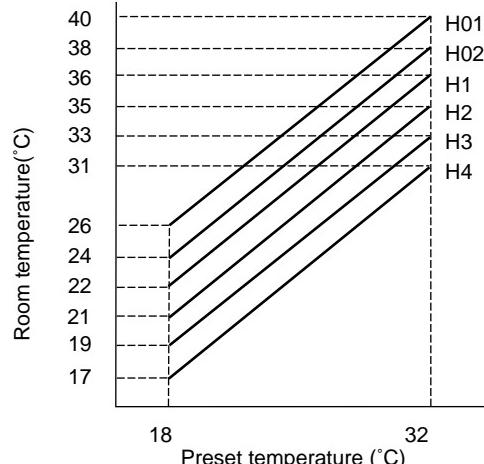
In the "DRY" mode, the thermostat circuit is controlled by three thermostat lines (D1 thru D3).



**Figure Y-2**

#### 1-3 HEAT operation

In the "HEAT" mode, the thermostat circuit is controlled by six thermostat lines (H01 thru H4).

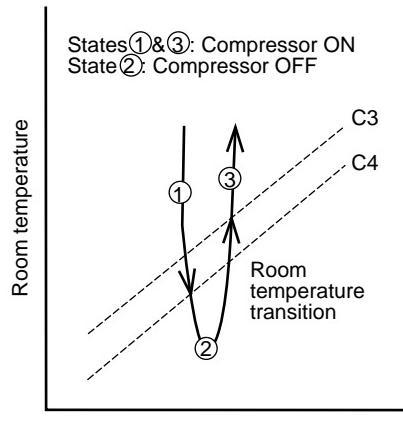


**Figure Y-3**

### 2. Operation modes

#### 2-1 COOL operation

The compressor turns on or off, at the thermostat lines C3 and C4. The outdoor fan motor is also controlled with the compressor.



**Figure Y-4**

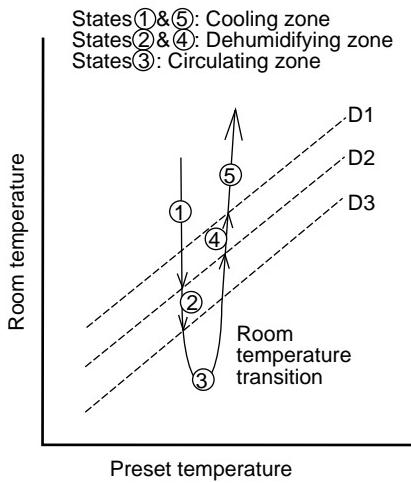
**2-2 DRY operation**

On the switch on, the compressor always starts to operate for 2 minutes with fan speed "D" (slower than "UL").

The microcomputer reads the room temperature 2 minutes after this first compressor operation. This room temperature is set as the preset temperature automatically.

The preset temperature ranges from 18°C to 32°C. When the room temperature is below 18°C, the preset temperature is set to 18°C, and when the room temperature is over 32°C, the preset temperature is set to 32°C.

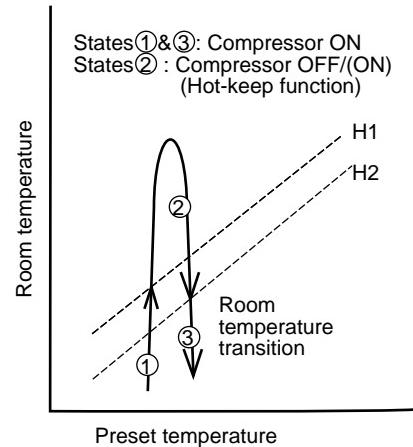
Dry operation is divided into three zones (Cooling zone, Dehumidifying zone and Circulating zone) by thermostat lines (D1 to D3), and the compressor and the fan motor are controlled in each zone as shown in Table Y-1.

**Figure Y-5****Table Y-1**

	Compressor	Fan Speed
Cooling zone	ON	"UL"
Dehumidifying zone	ON	"D"
Circulating zone	OFF	"D" or OFF

**2-3 Heat operation**

The compressor turns on or off, at State 2, turns on continuously at State 1 & 3.

**Figure Y-6****2-4 Fan only operation**

The indoor fan motor always turns on.

**3. Fan speed**

Fan speeds are given by the indoor fan motor, "H", "M", "L", "UL" and "D" which are available in the following operation mode.

**Table Y-2**

FAN Switch	HEAT	COOL	FAN ONLY
HIGH	H	M	M
LOW	M	L	L
SOFT	L	UL	UL

#### 4. Hot-Keep

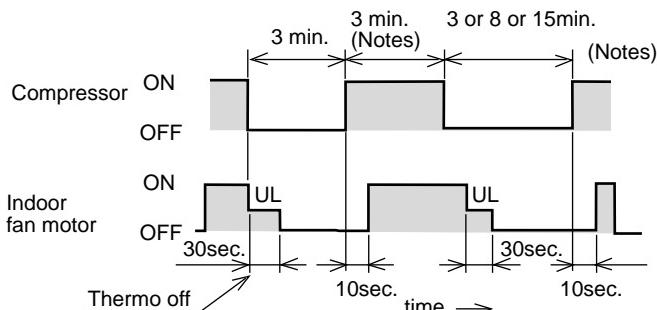
This function automatically controls the on-off operation of the indoor fan motor in accordance with the on-off operation of the compressor during the heating operation, thereby preventing the air conditioner from delivering a cold air when the compressor is off.

When the room temperature exceeds the thermostat line "H1", the compressor is turned off, and the indoor fan motor is turned off after rotating at "UL" for 30 seconds.

3 minutes after turning off the compressor, the compressor is turned on for 3 minutes. (below thermostat line H01). While over H01, the compressor is off.

At 10 seconds after turning on the compressor, the indoor fan motor is turned on.

The next compressor OFF time is for 3, 8 or more than 8 minutes according to the room temperature (the time increases with a rise of room temperature) when 3 minutes elapse after turning on the compressor.



Notes: Compressor is off when compressor OFF time is 15 minutes.

**Figure Y-7**

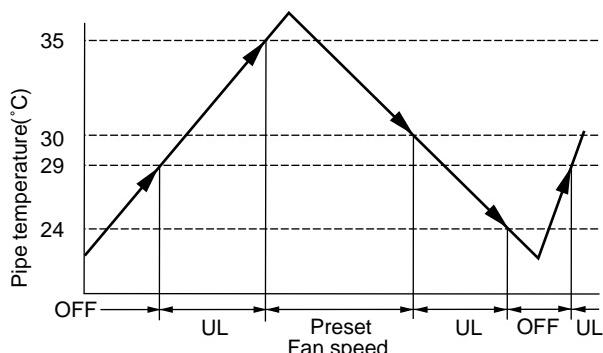
#### 5. Preheat air flow

This function is intended to prevent cold air from being discharged when the heating operation starts or when defrosting.

When the indoor pipe temperature is below 29°C at the beginning of the heat operation or after defrosting, the indoor fan motor stays.

When the indoor pipe temperature gets higher than 29°C, the fan motor is turned on at speed "UL" after compensation of starting.

When the indoor pipe temperature exceeds 35°C, the specified fan speed is restored. When the indoor pipe temperature falls below 30°C, the fan speed shifts down to "UL". And, when the indoor pipe temperature falls below 24°C, the fan motor turns off. Then, over 29°C , it turns on again at speed "UL".

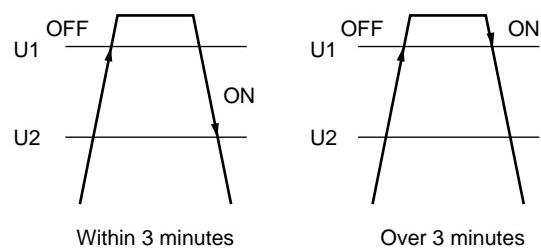


**Figure Y-8**

#### 6. Overheating protection system

When overloading occurs during the heating operation, this system controls the outdoor fan motor according to the indoor pipe temperature to prevent the overloading of the compressor and restrain the rise in high pressure. When the indoor pipe temperature exceeds U1°C, the outdoor fan motor is turned off, and when the indoor pipe temperature falls U2°C, the outdoor fan motor turns on.

If 3 minutes elapse after turning off outdoor fan motor, the outdoor fan motor is turned on, when the indoor pipe falls U1°C,



**Figure Y-9**

**Table Y-3**

MODELS	Fan Speed Line	M	L	UL
	U1	53°C	53°C	53°C
AY-A079E	U2	49°C	49°C	49°C
	U1	53°C	54°C	54°C
AY-A099E	U2	49°C	50°C	50°C

## 7. Current control

This system, in order to prevent overcurrent during heating operation, controls the outdoor fan motor and changes the indoor fan motor speed by detecting total current.

When the current exceeds P2, the outdoor fan motor is automatically turned off, and when the current falls below P4, the outdoor fan motor is turned on.

When the current exceeds P3 and the indoor fan speed shifts down because of cold air (5. Preheat air flow), the changes in the indoor fan speed shifts up as follows, from "off" to "UL", or from "UL" to "L". And when the current falls below P5, the indoor fan speed shift up is canceled.

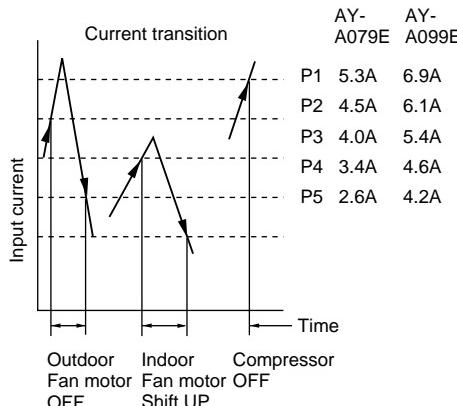


Figure Y-10

## 8. Freeze preventive

When the indoor pipe temperature falls below -1°C during cool operation or dry operation, the compressor is turned off.

## 9. Defrost

The defrost timer (integrating the operation time of compressor) counts time with microcomputer during heat operation.

Frost of outdoor pipe is estimated by indoor pipe temperature (TH2), room temperature (TH1), indoor fan speed and operation state of compressor.

In the defrost operation, first the compressor is turned off, the fan speed is set to "UL" and the outdoor fan motor is turned off.

30 seconds later the indoor fan motor is turned off, 50 seconds later the reverse valve is turned off, and 60 seconds later the compressor is turned on.

In the end of defrosting, the compressor is turned off, the outdoor fan motor is turned on, 50 seconds later the reverse valve is turned on, 60 seconds later the compressor is turned on, starting heat operation.

At this time, the indoor fan motor is turned off or the fan speed is set to "UL" if preheat air flow function is effective.

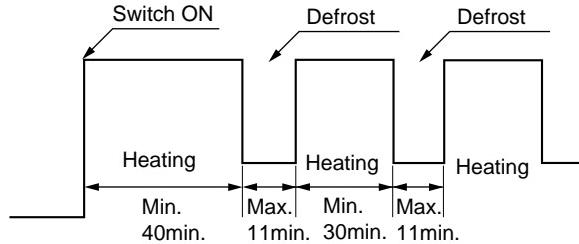


Figure Y-11

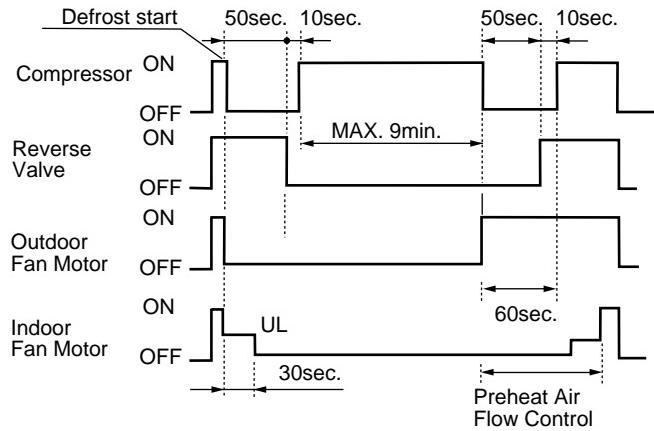


Figure Y-12

## 10. Delayed operation of the reverse valve

When the heat operation is shut down or the operating mode is switched from heat to cool or dry, or vice versa, the reverse valve is switched after 3 minutes.

## 11. Test run

If the "TEST RUN" button in the unit is pushed during suspension of operation, cool test operation starts. At this time, the fan speed is set to "AUTO".

If this button is pushed during operation, the test operation starts in current operation mode. The operation LED (red) flickers during test run.

In cool and heat mode continuous compressor on operation is performed. In dry mode the operation is in dehumidifying zone. In fan only mode the indoor fan motor runs continuously.

## 12. Timer

12-1 24-HOUR PROGRAMMABLE ON/OFF TIMER  
ON-TIMER or OFF-TIMER can be independently programmed. When the unit operates during one hour after the OFF-time is set, thermostat setting is automatically shifted (+1°C in cool operation and dry operation, -3°C in heat operation, 16°C - 32°C).

When the ON-timer is set in heat operation and cool operation, operation starts before 0 to 30 minutes(depends on the room temperature) so that preset temperature is obtained at set time.

### 12-2 ONE-HOUR TIMER

When ONE-HOUR timer is set, the unit turns off automatically after one hour. The one hour timer operation has priority over other time operation, such as the TIMER ON and TIMER OFF. If the ONE-HOUR TIMER button is pressed again during operation, the unit will operate additionally for another one hour.

### 13. Automatic air conditioning

When automatic air conditioning is selected, the operation mode and preset temperature are set automatically according to the room temperature on starting operation.

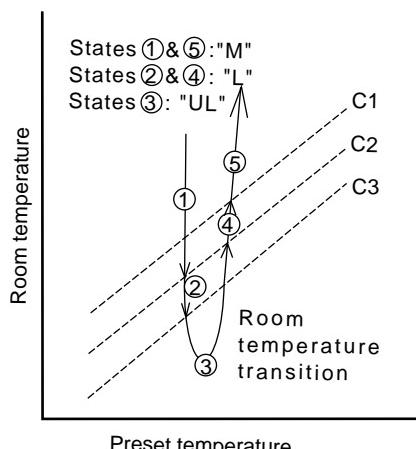
**Table Y-4**

Room temperature at operation start	Operation Mode	Preset Temperature
Above 28°C	COOL	26°C
26°C ~ 28°C		25°C
24°C ~ 26°C		24°C
21°C ~ 24°C	DRY	Room temperature at operation start
Below 21°C	HEAT	23°C

### 14. Automatic fan speed

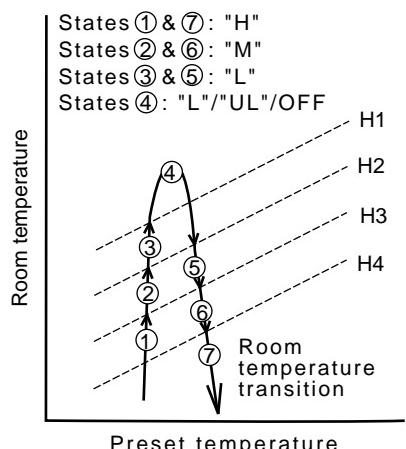
When the automatic fan speed is selected in cool or heat operation, the fan speed is automatically changed by the thermostat lines C1 to C3 in cool operation, and H1 to H4 in heat operation.

a.COOL operation



**Figure Y-13**

b. HEAT operation



**Figure Y-14**

### 15. Outputs in each operation mode

**Table Y-5**

Mode	Compressor	Outdoor Fan Motor	Indoor Fan Motor	Valve Coil
COOL	Cooling	ON	ON	ON
	Circulating	OFF	OFF	ON
	Normal	ON	ON	ON
		OFF	OFF	ON/UL/OFF
HEAT	Preheat Air Flow Control	ON	ON	UL/OFF
	ON Defrost	ON	OFF	OFF
	DRY			L/UL OFF
DRY	Dehumidifying	ON	ON	UL/D OFF
	OFF	OFF	D/OFF OFF	
	FAN ONLY	OFF	OFF	ON OFF

### 16. Power on start

If the connecting wire "POWER ON" (JP8) is cut on the PWB ass'y, when the power is supplied by turning on a circuit breaker, the air conditioner automatically starts of operation in "AUTO".  
(Refer to Figure L-2. Printed Wiring Board.)

### 17. AUTO RESTART

Power failure occurs during operation, the unit will restart in the same operation mode as before after power recovery.  
(Refer to Figure L-2. Printed Wiring Board.)

### 18. Test mode

#### 18-1 TEST 1 (For control circuit operation checking)

Make terminals 1 and 2 of connector CN4 short-circuited and supply the power.  
Hereby the timer's period becomes shortened.  
In this test mode, the control times are shortend as follows.

The operation LED flicker's period

in Test run

The protector timer

The defrost timer

not shortened

Other controls; 1/60 (ex.; 3 min. to 3 sec.)

#### 18-2 TEST 2 (For output of each operation checking)

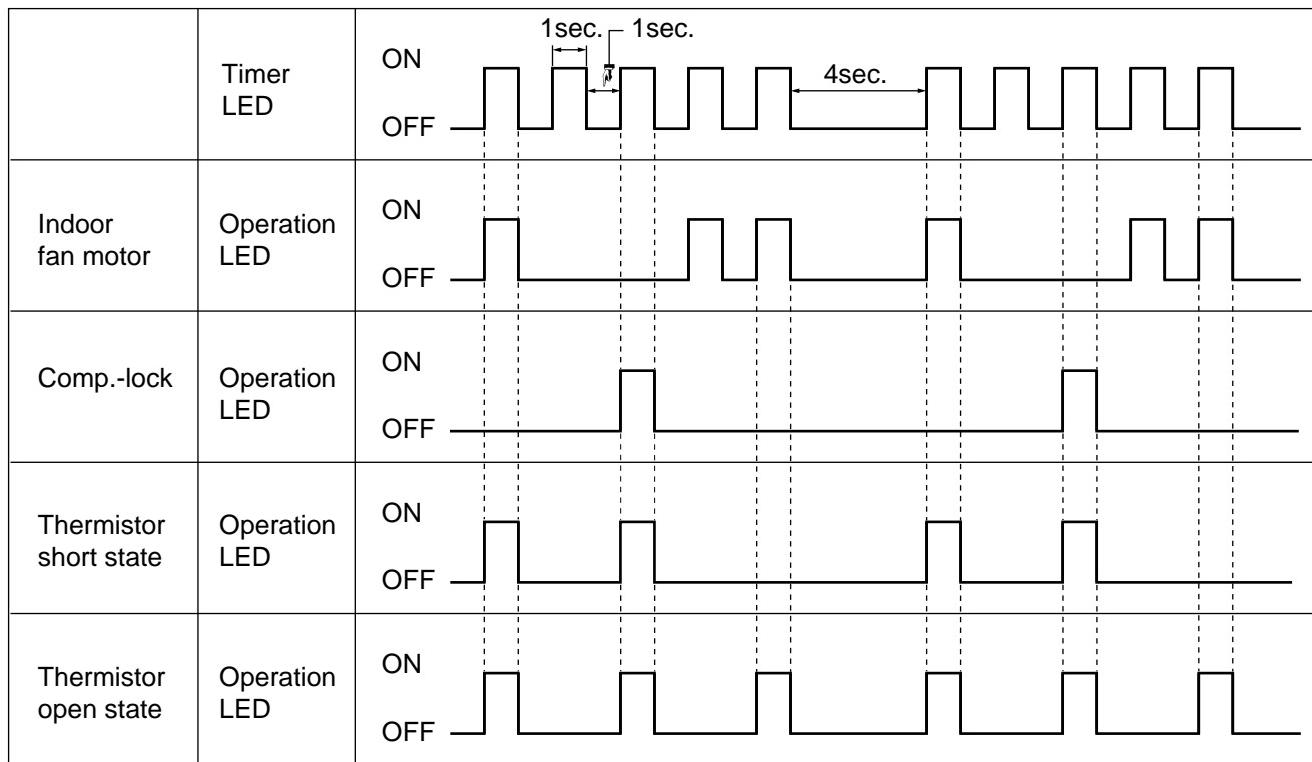
Keep pushing both the buttons, "AUX." and "TEST RUN", and supply the power, the system will go to the test 2 mode. In this mode, the output of operation is switched by pushing the "TEST RUN" button in the unit or the "OI" button in the remote controller. Use the "AUX." button to back to step 1.

Normal outputs are shown in Table Y-6 and Y-7.

## 19. Diagnosis procedure

When indoor fan motor is out of order or compressor lock occurs, the compressor, inddor fan motor, outdoor fan motor, and louver are all stopped and the operation LED(red) turns on or off synchronously with the timimg of the timer LED.

When the thermistor for room temperature or pipe temperature is open or short state, the operation LED turns on or off syncronously with the timing of the timer LED by pushing continuously for more than three seconds both "TEST" button and "AUX." button.



Timing chart of Timer LED and Operation LED of DIAGNOSIS PROCEDURE.

When "OI" button the remote controller or "AUX." button in the unit is pushed, the unit is free from DIAGNOSIS PROCEDURE.

Table Y-6 [AY-A079E]

Step	Output for outdoor unit	Lamps		Indoor Fan motor	Louver
		RED	YELLOW		
1	OFF	※1	※2	OFF	OPEN
2	Compressor	Flickering	ON	D	OFF
3	Reverse Valve	ON	OFF	H	OFF
4	Outdoor Fan Motor	ON	ON	L	CLOSE
5	OFF	ON	OFF	D	OFF
6	OFF	OFF	※3	UL	OFF
7	OFF	OFF	OFF※4	H	OFF
8	OFF	OFF	OFF	M	OFF
9	OFF	OFF	OFF	L	OFF
10	OFF	OFF	ON	OFF	OFF
11	OFF	OFF	OFF	OFF	OFF
12	OFF	ON	OFF	OFF	OFF
13	OFF	OFF	OFF	OFF	OFF
14	OFF	ON	ON	OFF	OFF
15	OFF	ON	ON	OFF	OFF
16	OFF	ON	OFF	OFF	OFF
17	OFF	OFF	OFF	OFF	OFF
18	OFF	OFF	OFF	OFF	OFF
19	OFF	OFF	OFF	OFF	OFF
20	OFF	ON	OFF	OFF	OFF
21	OFF	OFF	ON	OFF	OFF
22	OFF	ON	ON	OFF	OFF
23	OFF	OFF	OFF	OFF	OFF
	(Back to step 1)				

※1 :  $7^{\circ}\text{C} \leq \text{Room temp.} < 42^{\circ}\text{C}$  ..... ON  
       :  $7^{\circ}\text{C} > (\text{Room temp.})$  or  $(\text{Room temp.}) \geq 42^{\circ}\text{C}$  ..... OFF

※2 :  $-2^{\circ}\text{C} \leq \text{Pipe temp.} < 42^{\circ}\text{C}$  ..... ON  
       :  $-2^{\circ}\text{C} > (\text{Pipe temp.})$  or  $(\text{Pipe temp.}) \geq 42^{\circ}\text{C}$  ..... OFF

※3 :  $0.1\text{V} \leq (\text{P57 input voltage}) \leq 0.45\text{V}$  ..... ON  
       :  $0.1\text{V} > (\text{P57 input voltage})$  or  $(\text{P57 input voltage} > 0.45\text{V})$  ..... OFF

※4 : When Power on start is effective, Timer LED(yellow) is ON.

Table Y-7[AY-A099E]

Step	Output for outdoor unit	Lamps		Indoor Fan motor	Louver
		RED	YELLOW		
1	OFF	※1	※2	OFF	OPEN
2	Compressor	Flickering	ON	D	OFF
3	Reverse Valve	ON	OFF	H	OFF
4	Outdoor Fan Motor	ON	ON	L	CLOSE
5	OFF	ON	OFF	D	OFF
6	OFF	OFF	※3	UL	OFF
7	OFF	OFF	OFF	H	OFF
8	OFF	OFF	OFF	M	OFF
9	OFF	OFF	OFF	L	OFF
10	OFF	OFF	ON	OFF	OFF
11	OFF	OFF	OFF	OFF	OFF
12	OFF	ON	OFF	OFF	OFF
13	OFF	ON	OFF	OFF	OFF
14	OFF	ON	ON	OFF	OFF
15	OFF	ON	OFF	OFF	OFF
16	OFF	ON	OFF	OFF	OFF
17	OFF	OFF	OFF	OFF	OFF
18	OFF	ON	OFF	OFF	OFF
19	OFF	ON	OFF	OFF	OFF
20	OFF	OFF	ON	OFF	OFF
21	OFF	ON	OFF	OFF	OFF
22	OFF	OFF	ON	OFF	OFF
23	OFF	OFF	OFF	OFF	OFF
	(Back to step 1)				

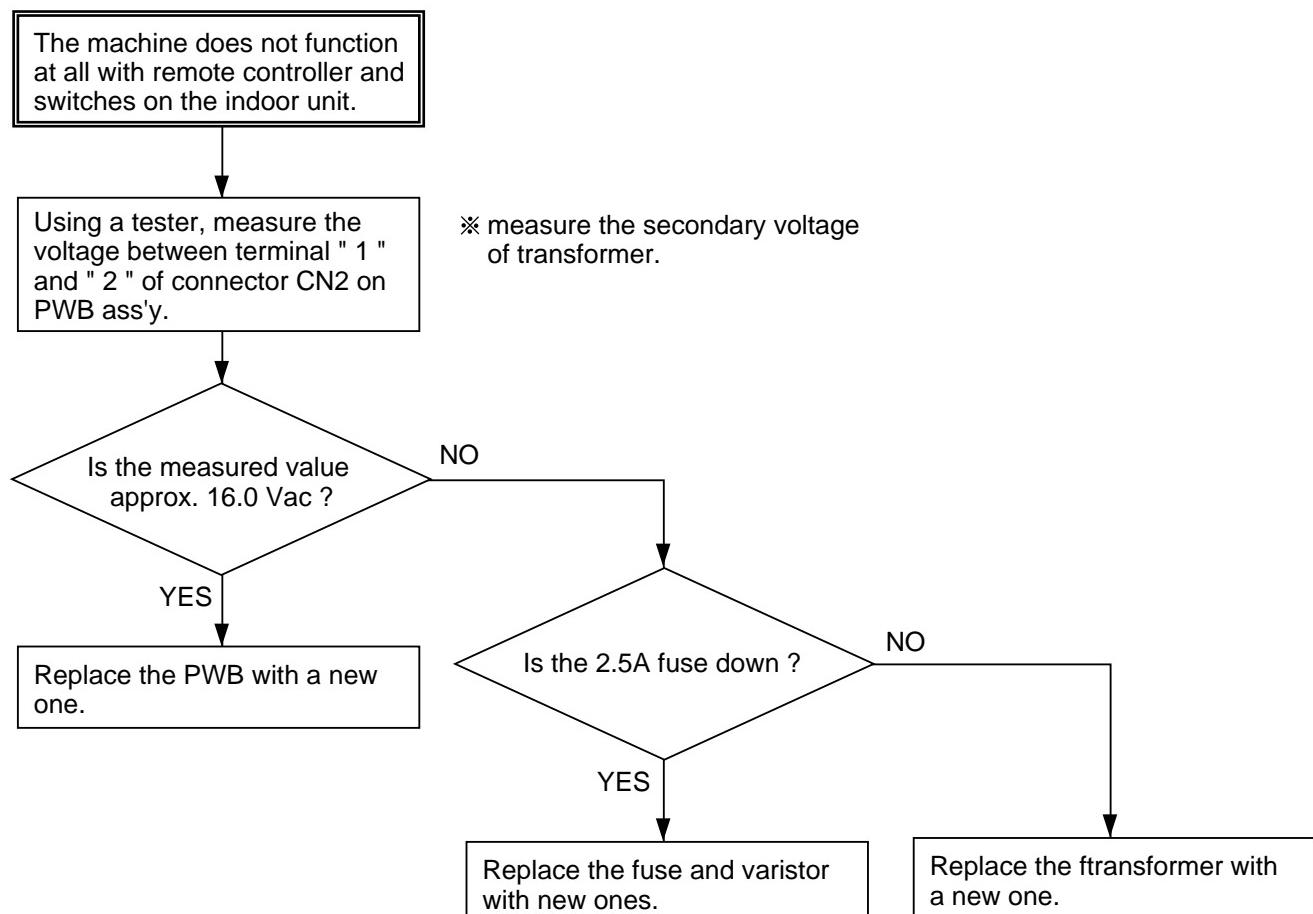
※1 :  $7^{\circ}\text{C} \leq \text{Room temp.} < 42^{\circ}\text{C}$  ..... ON  
       :  $7^{\circ}\text{C} > (\text{Room temp.}) \text{ or } (\text{Room temp.}) \geq 42^{\circ}\text{C}$  ..... OFF

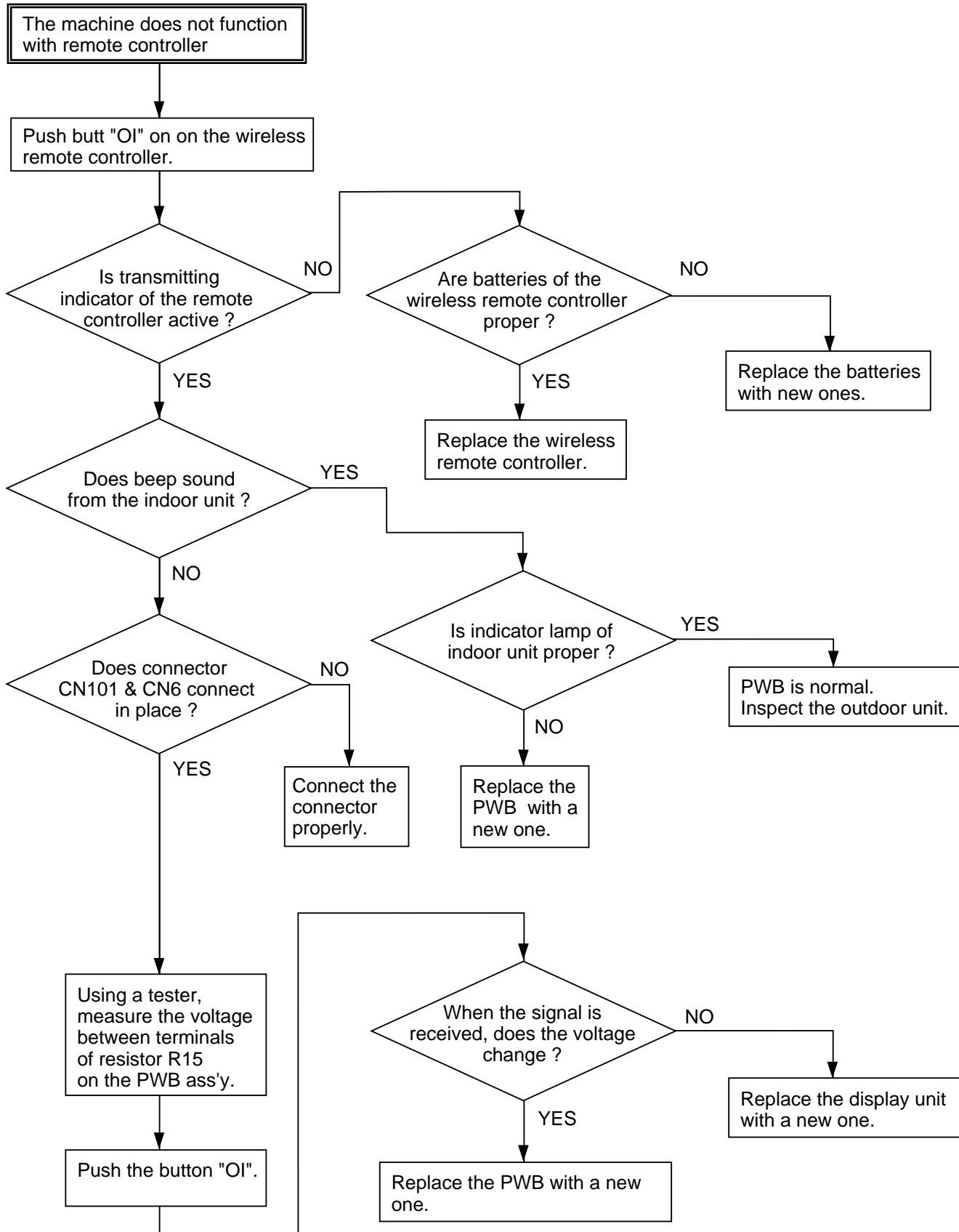
※2 :  $-2^{\circ}\text{C} \leq \text{Pipe temp.} < 42^{\circ}\text{C}$  ..... ON  
       :  $-2^{\circ}\text{C} > (\text{Pipe temp.}) \text{ or } (\text{Pipe temp.}) \geq 42^{\circ}\text{C}$  ..... OFF

※3 :  $0.1\text{V} \leq (\text{P57 input voltage}) \leq 0.45\text{V}$  ..... ON  
       :  $0.1\text{V} > (\text{P57 input voltage}) \text{ or } (\text{P57 input voltage}) > 0.45\text{V}$  ..... OFF

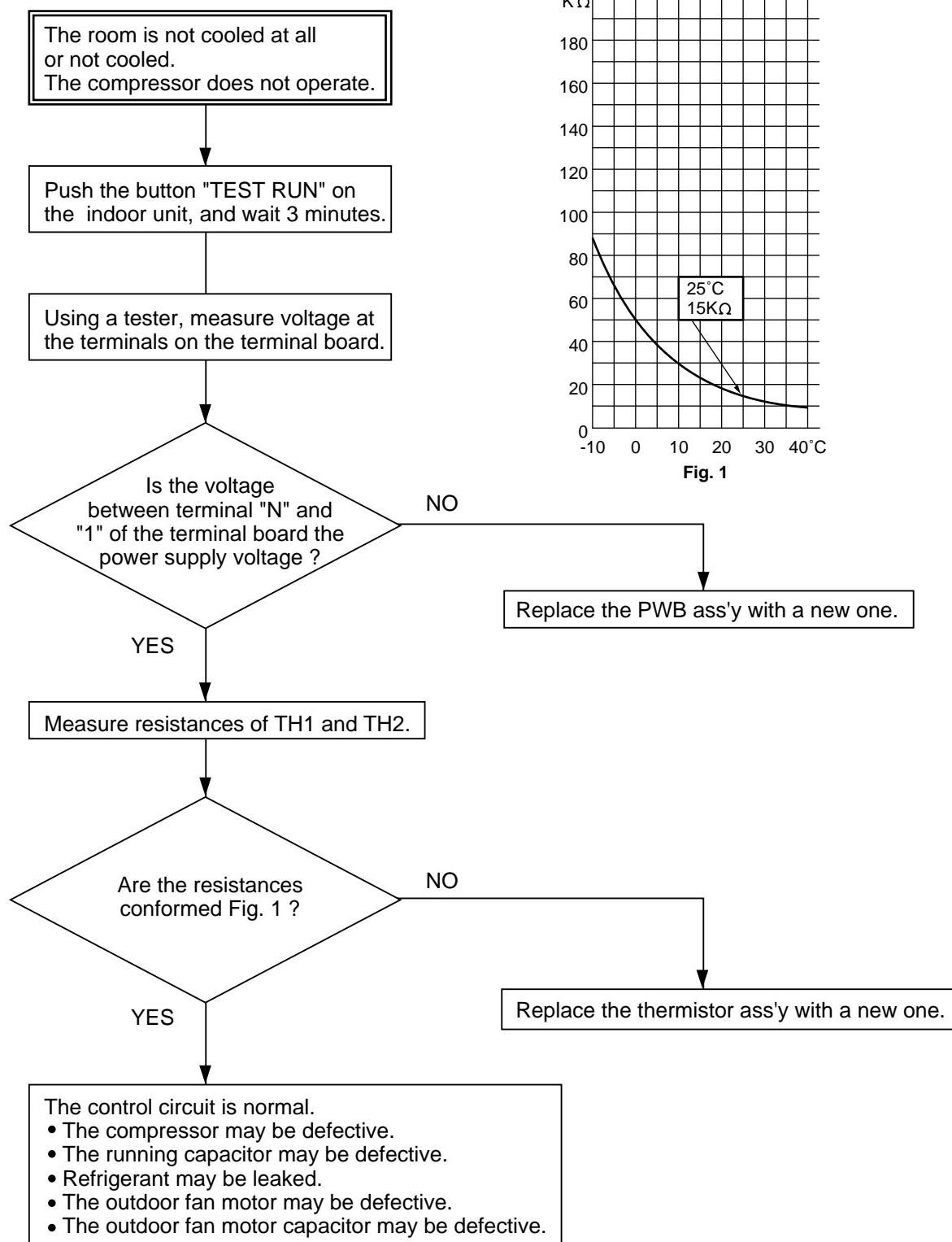
※4 : When Power on start is effective, Timer LED(yellow) is ON.

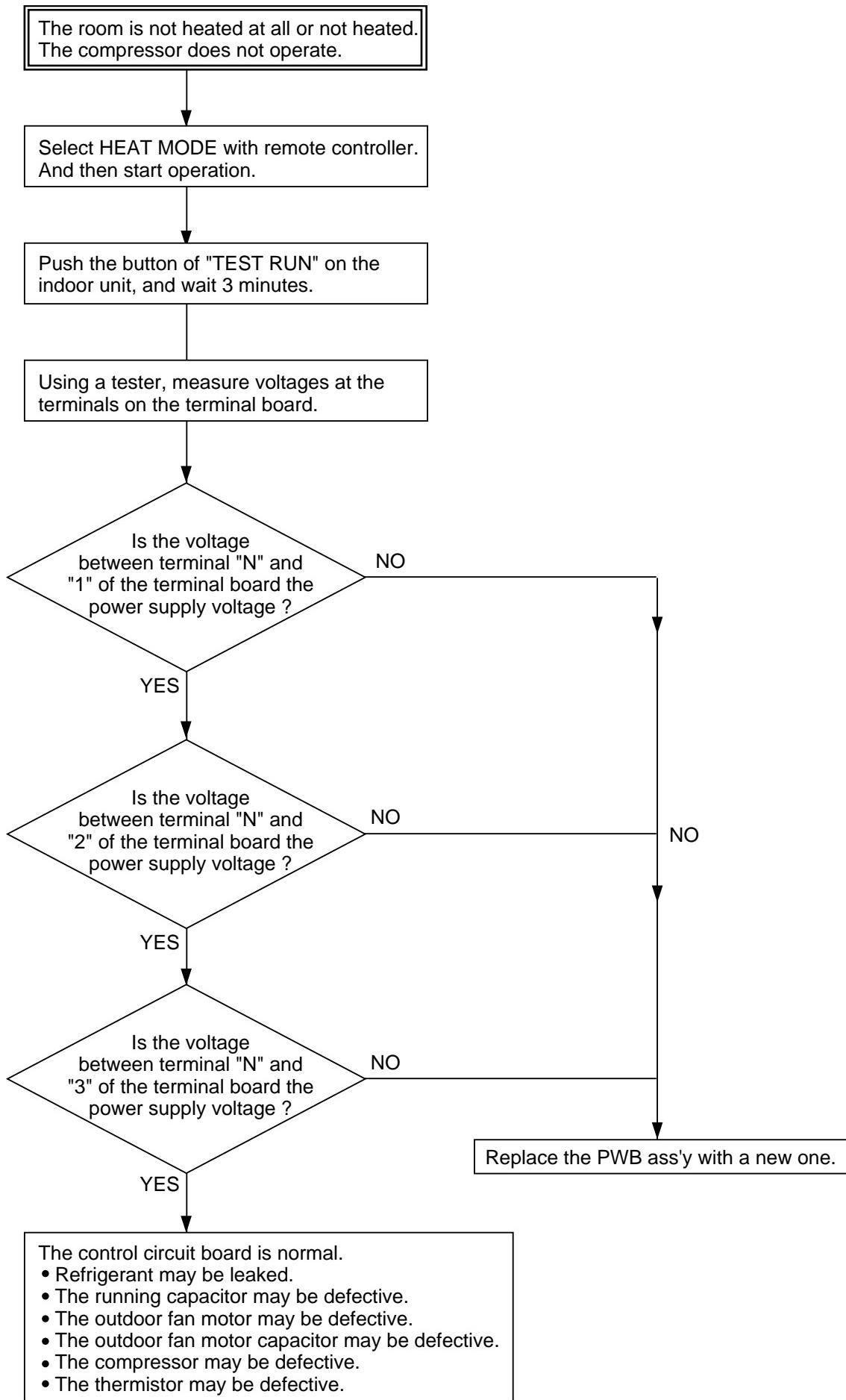
## TROUBLESHOOTING GUIDE OF CONTROL CIRCUIT





CHARACTERISTIC OF TH1 & TH2





## REFRIGERATION CYCLE

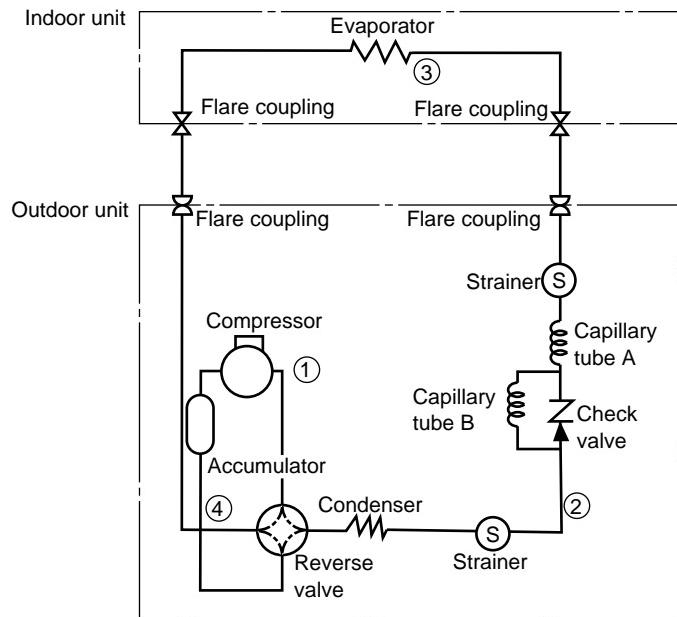


Figure R-1. Refrigeration Cycle for AY-A079E and AY-A099E

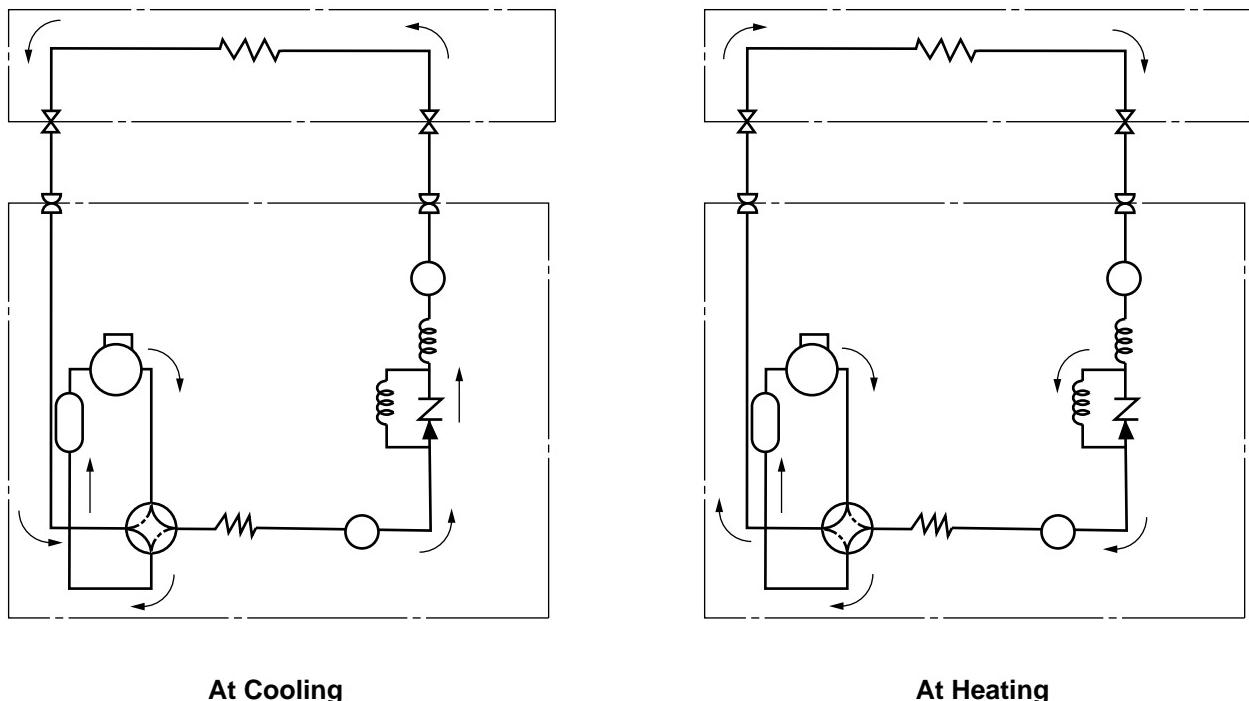


Figure R-2. Flow of Refrigerant for AY-A079E and AY-A099E

**Cycle temperature and service port pressure**

ISO Cooling and Heatpump condition  
(at 220V REFRIGERANT PIPE LENGTH 7.5 m)

Model	AY-A079E		AY-A099E	
NO. Condition	Cooling	Heating	Cooling	Heating
①	78°C	65°C	80°C	84°C
②	43°C	2°C	44°C	1°C
③	11°C	33°C	11°C	35°C
④	8°C	1 °C	6°C	3 °C
※ Service port pressure	0.52MPa	1.49MPa	0.47MPa	1.75MPa

※ Gauge pressure

**ISO Cooling and Heatpump condition**

	Indoor side		Outdoor side	
	Temperature (°C)	Relative humidity (%)	Temperature (°C)	Relative humidity (%)
Cooling	27	47	35	40
Heating	20	37	7	87

**Dimension of Capillary tube**

MODEL	AE-A079E			AE-A099E		
	O.D.	I.D.	L	O.D.	I.D.	L
Capillary tube A	ø 2.7	ø 1.5	800	ø 2.7	ø 1.5	700
Capillary tube B	ø 2.7	ø 1.4	600	ø 2.7	ø 1.5	700

## PERFORMANCE CURVES

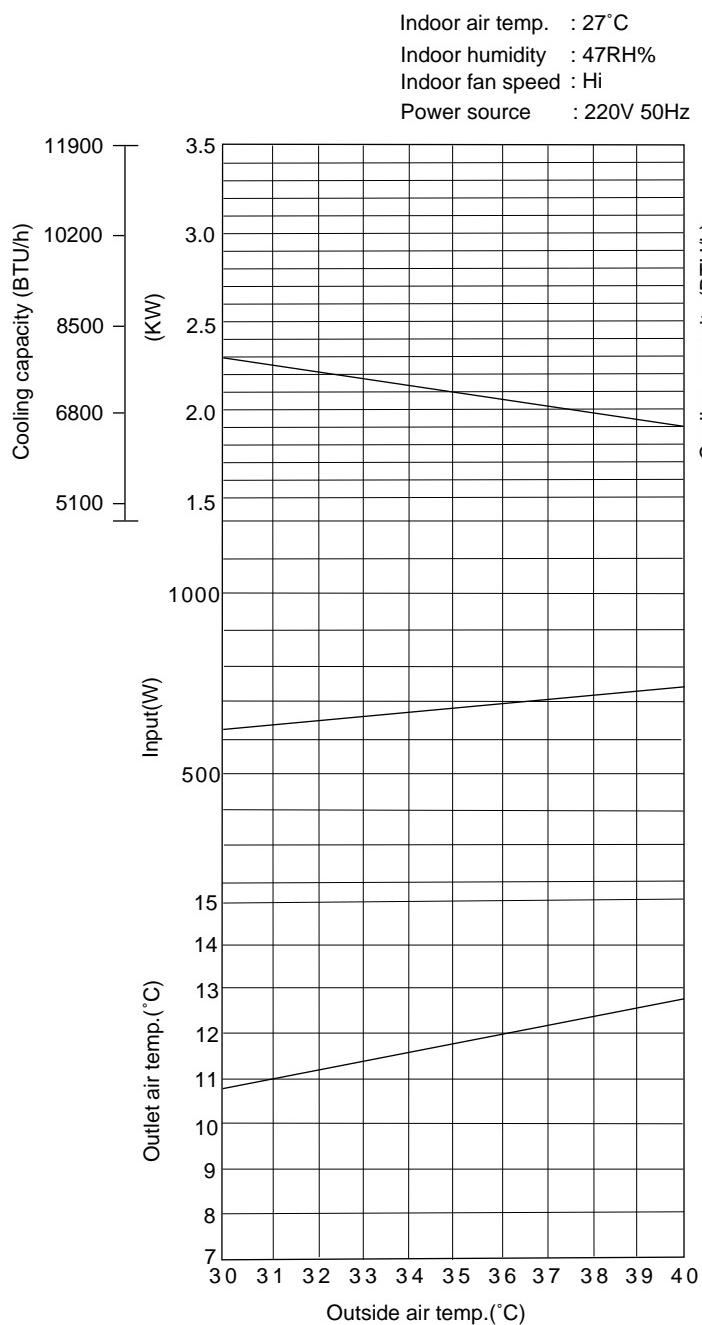


Figure P-1. At Cooling for AY-A079E

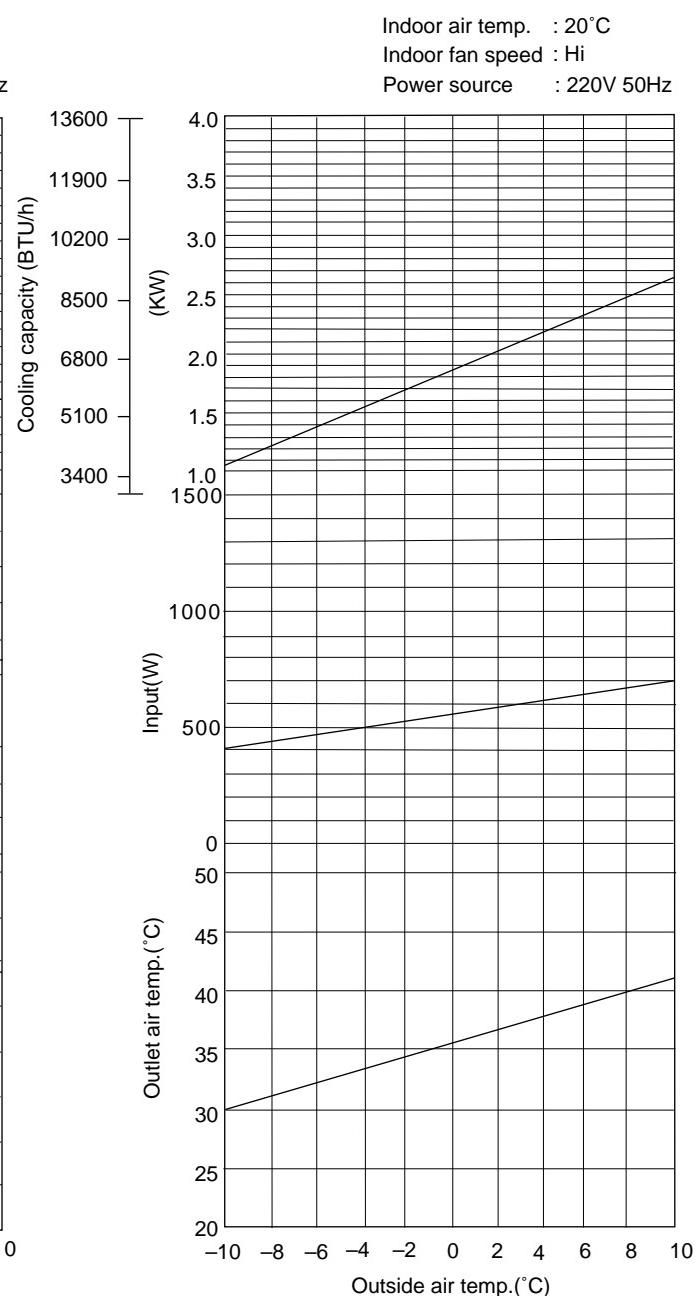


Figure P-2. At Heating for AY-A079E

Indoor air temp. : 27°C  
 Indoor humidity : 47RH%  
 Indoor fan speed : Hi  
 Power source : 50Hz, 220V

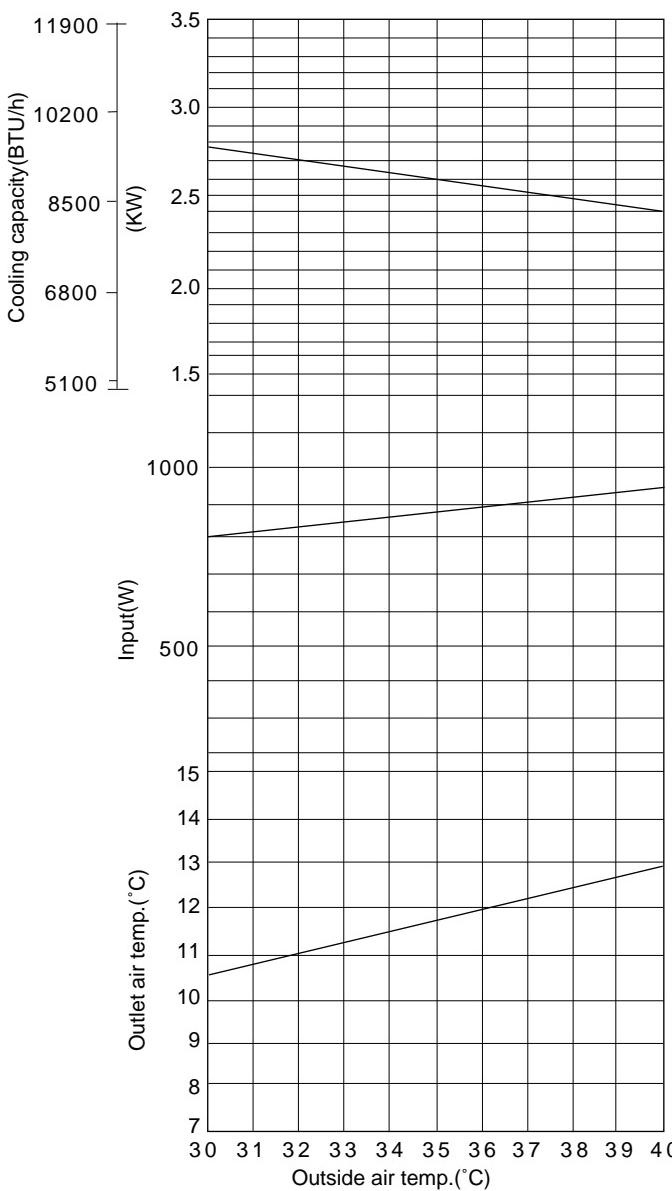


Figure P-3. At Cooling for AY-A099E

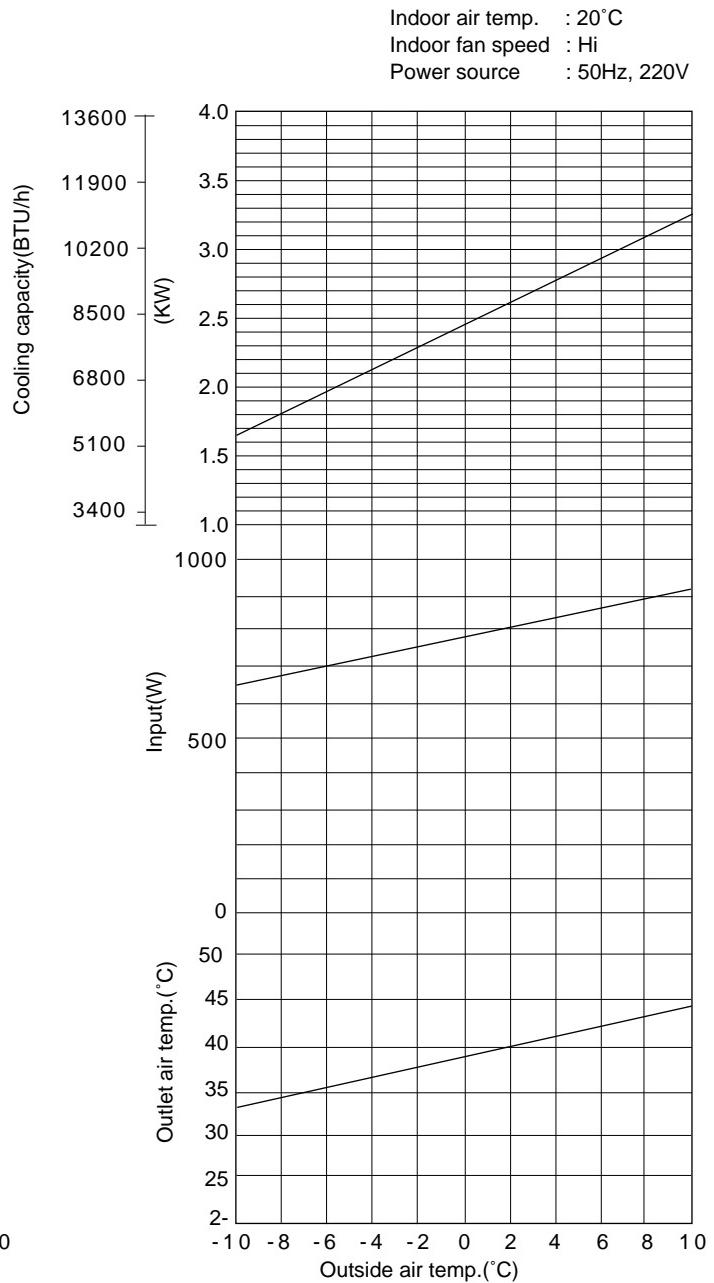


Figure P-4. At Heating for AY-A099E

## REFRIGERANT PIPE INSTALLATION WORKS

Refrigerant pipe length and level difference between the indoor and outdoor units.

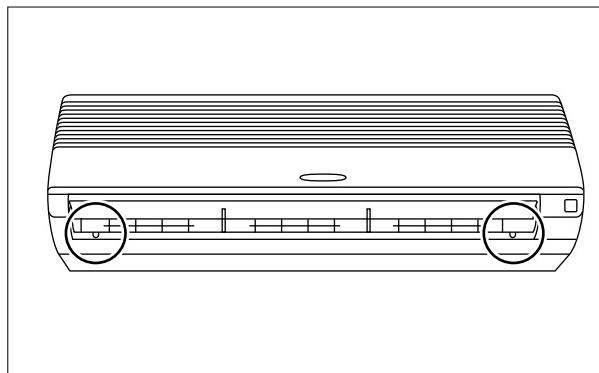
PIPE SIZE		STANDARD PERMISSIBLE LENGTH	PERMISSIBLE LEVEL DIFFERENCE
GAS	LIQUID		
3/8"	1/4"	10 m	5 m

The shorter refrigerant pipe, the higher the machine capability. Keep the pipeline as short as possible.

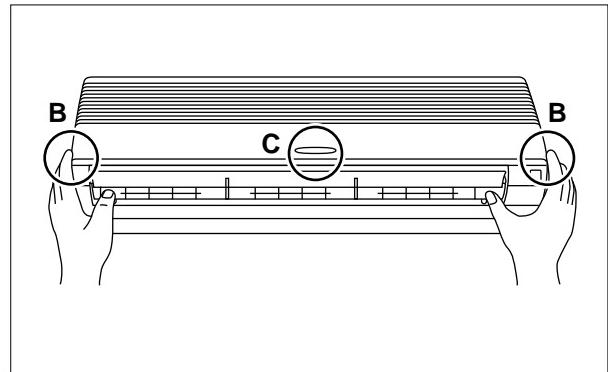
## DISASSEMBLING PROCEDURE FOR INDOOR UNIT MODEL AY-A079E/AY-A099E

**CAUTION: DISCONNECT THE UNIT FROM THE POWER SUPPLY BEFORE ANY SERVICING**

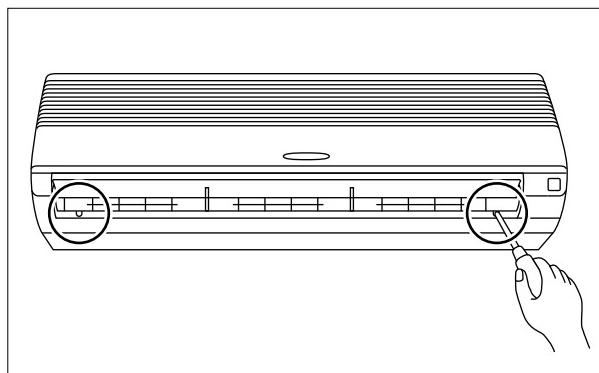
1. Remove the 2 screw covers in the front panel.



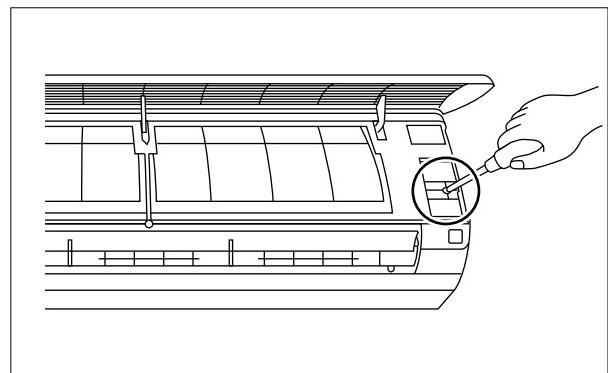
4. Close the open panel softly, and then press " B " and " C " of it securely.  
Remove the front panel ass'y as to lift up.



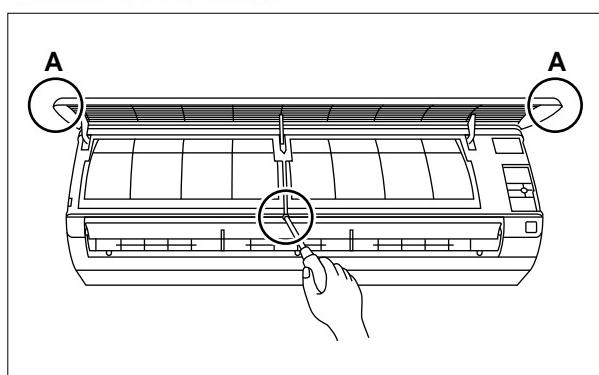
2. Remove 2 fixed screws.



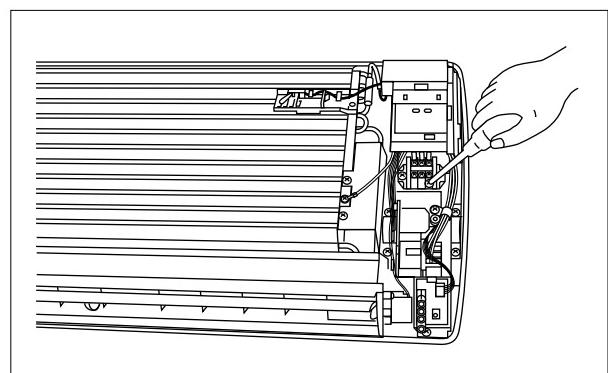
5. Loose a cord clamp screw and take it out.



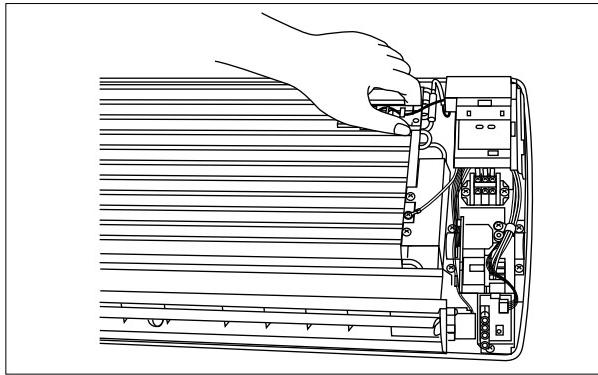
3. Pull the open panel at " A " toward you.  
Remove a fixed screw.



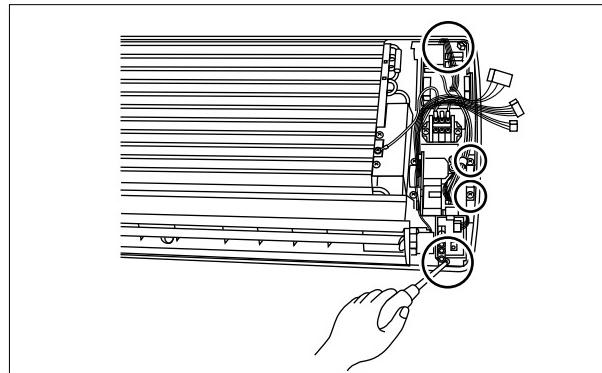
6. Loose 3 screws on the terminal board and take out the unit-to-unit cord from it.



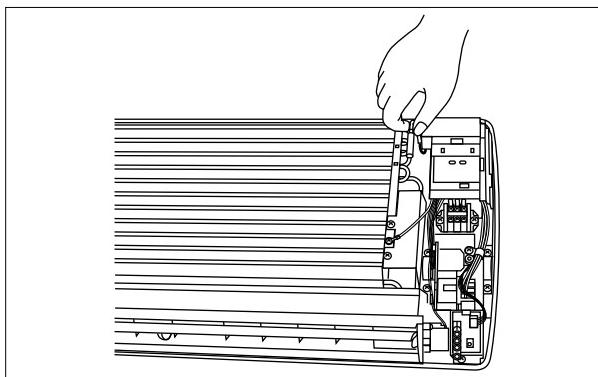
7.Take the thermistor holder from evaporator.



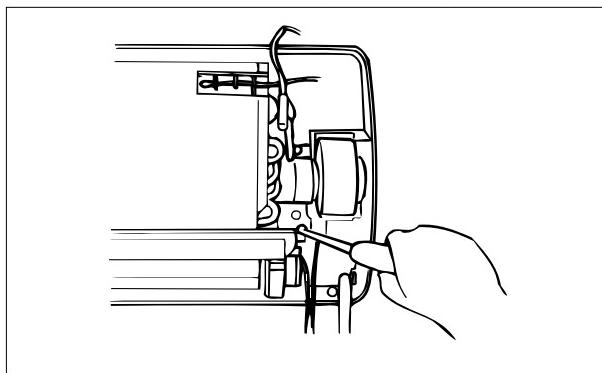
11.Losen 4 screws fixing control box and take out control ass'y.



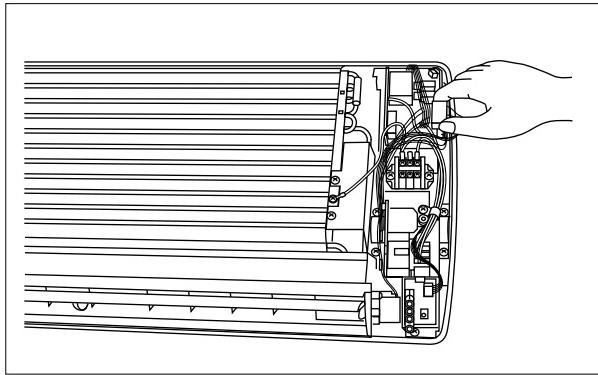
8.Take out the thermistor from evaporator.



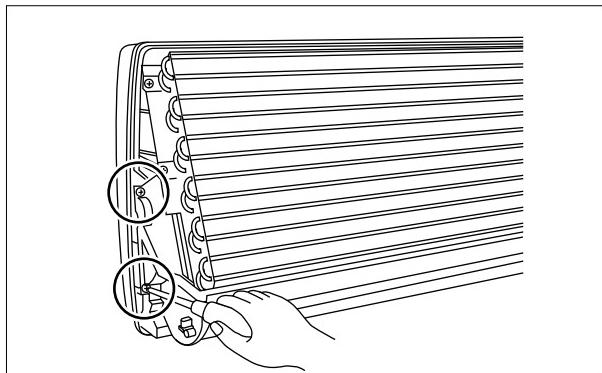
12.Loose a screw fixing drain pan ass'y.(Right side)



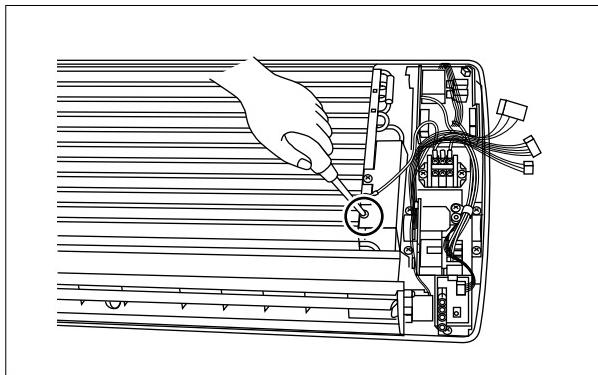
9.Disconnect fan motor connectors and others.



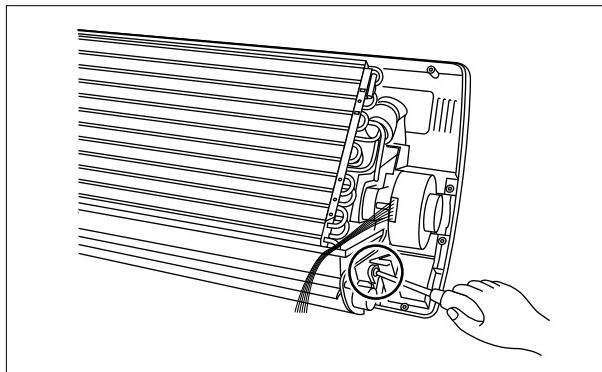
13.Loose 2 screws fixing drain pan ass'y.(Left side)



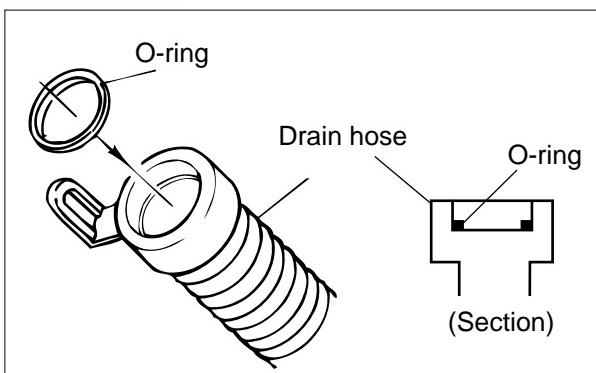
10.Loose 1 screw for a pipe cover and take it out.  
Loose the earth screw.



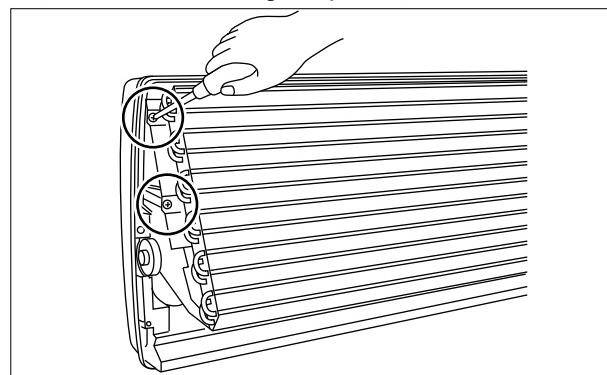
14.Loose a screw fixing drain hose.



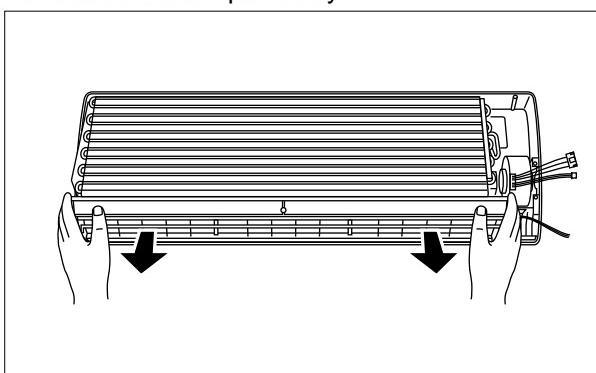
15. When assembling make sure that O-ring is fitted to the drain hose.



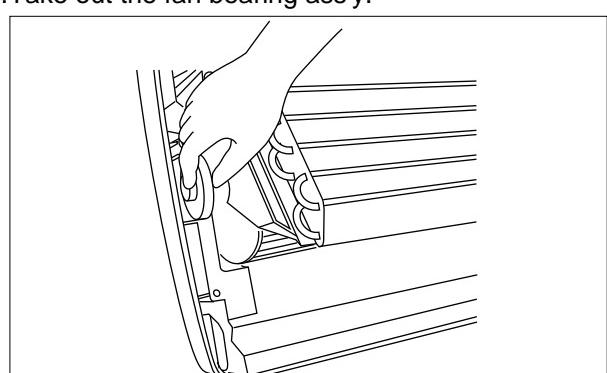
19. Loosen 2 screws fixing evaporator.



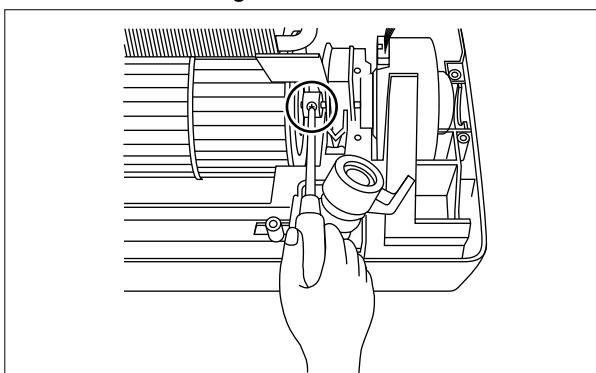
16. Take out the drain pan ass'y.



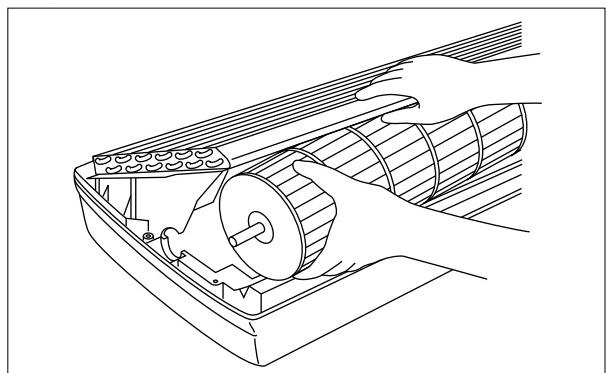
20. Take out the fan bearing ass'y.



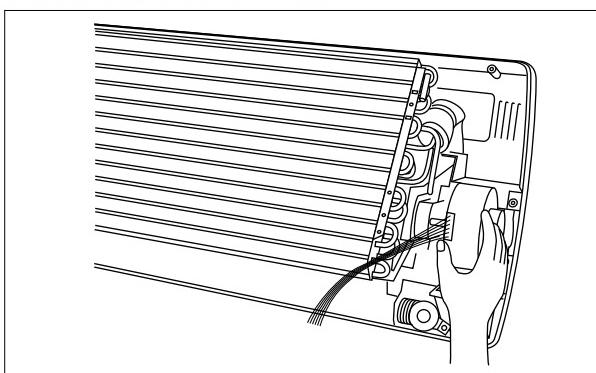
17. Loose a screw fixing cross flow fan to motor.



21. Take out the cross flow fan while slightly lifting the evaporator.



18. Slide the cross fan leftward to depart from the motor shaft and take out fan motor.

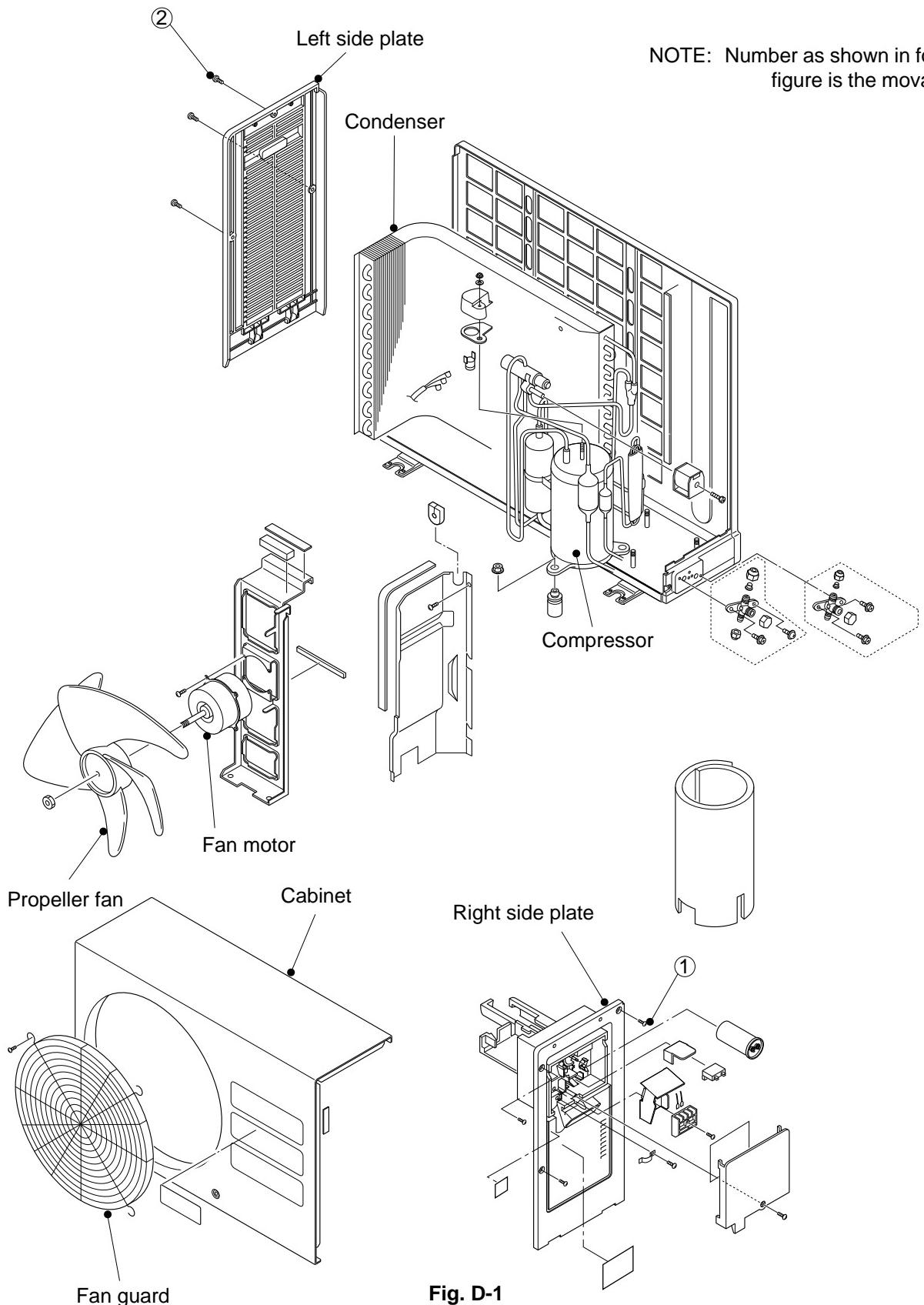


## FOR OUTDOOR UNIT MODEL AE-A079E AND AE-A099E

**CAUTION: DISCONNECT THE UNIT FROM THE POWER SUPPLY BEFORE ANY SERVICING**

- ① Remove the three (3) screws holding the right side plate and take it out.
- ② Remove the three (3) screws holding the left side plate and take it out.
- ③ Remove the another screws holding the cabinet and take it out..

NOTE: Number as shown in following figure is the moval order.



**Fig. D-1**

**REPLACEMENT PARTS LIST [AY-A079E/AY-A099E]**

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
<b>CABINET AND UNIT PARTS</b>				
1- 1	CMOT-A273JBK0	Fan motor sub assembly	1	BN
1- 2	NFANCA042JBE0	Cross flow fan	1	BC
1- 3	CSRA-A444JBK0	Drain pan assembly	1	BK
1- 4	MJNTPA040JBFF	Louver link	3	AC
1- 5	MLOV-A135JBFF	Horizontal adjustment louver A (Vertical louver A)	9	AC
1- 6	MLOV-A136JBFF	Horizontal adjustment louver B (Vertical louver B)	3	AC
1- 7	MLOV-A133JBFE	Vertical adjustment louver A (Horizontal louver A)	1	AK
1- 8	MLOV-A134JBFE	Vertical adjustment louver B (Horizontal louver B)	1	AK
1- 9	PPACGA002JBE0	O ring	1	AA
1-10	RMOT-A050JBE0	Louver motor	1	AY
1-11	PGUMMA071JBE0	Motor cushion	1	AN
1-12	LHLD-A197JBFP	Louver holder	4	AC
1-13	PGUMMA086JBE0	Motor cushion	1	AG
1-14	PCOV-A190JBE0	Drain cover	1	AE
1-15	CHLD-A053JBK0	Bearing assembly	1	AD
1-16	LHLD-A187JBFA	Tube holder	1	AD
1-17	PSHE-A099JBE0	Evaporator sheet	1	AH
1-18	LSPR-A006JBE0	Sheet spring for fixing evaporator seat	2	AB
1-19	DCHS-A255JBK0	Cabinet assembly	1	AZ
1-20	DWAK-A779JBK0	Panel assembly	1	AX
1-21	PFILMA077JBEB	Air filter	2	AN
1-22	HDEC-B020JBEA	Display cover	1	AL
1-23	HBKG-A059JBFA	Badge	1	AF
1-24	LHLD-A209JBFA	Front panel hinge R	1	AF
1-25	MARMPA012JBFA	Open panel hinge L	1	AD
1-26	MARMPA013JBFA	Open panel hinge R	1	AD
1-27	LHLD-A208JBFA	Front panel hinge L	1	AD
1-28	PBOX-A120JBK0	Louver gear assembly	1	AZ
1-29	NBRG-A026JBFA	Louver bushing	2	AB
1-30	PSHE-A098JBE0	Evaporator seal	1	AC
1-31	TLABPA175JBR0	Louver seal	1	AB
1-32	TSPC-C981JBRA	Name label [AY-A079E]	1	AD
1-32	TSPC-C955JBRA	Name label [AY-A099E]	1	AD
1-33	PGUMSA046JBE0	Damper rubber	1	AD
1-34	CPNL-A084JBK0	Open panel assembly	1	AV
1-35	PFPFPB074JBE0	Thermistor insulation	1	AB
1-36	PHOS-A015JBE0	Drain hose	1	AL
1-37	LHLD-A204JBFO	Motor holder	1	AE
1-38	PSEL-B417JBE0	Aluminum tape	1	AC
1-39	PSEL-B418JBE0	Aluminum tape	1	AD
1-40	PSEL-B494JBE0	Aluminum tape	1	AD
1-41	PSEL-B492JBE0	Aluminum tape	1	AC
<b>CONTROL BOX PARTS</b>				
2- 1	FSGY-A141JBK0	Display board unit	1	AS
2- 2	FPWBFA013JBK0	Switch board unit	1	AM
2- 3	QTAN-A087JBE0	Terminal board (5P)	1	AS
2- 4	QTAN-A088JBE0	Terminal board (3P)	1	AP
2- 5	DPWBFA151JBK0	Control board unit [AY-A079E]	1	BQ
2- 5	DPWBFA149JBK0	Control board unit [AY-A099E]	1	BR
2- 6	OFS-AA050JBE0	Fuse 250V 2.5A	1	AD
2- 7	QACC-A194JBE0	Power supply cord	1	AU
2- 8	RTRN-A182JBE0	Transformer	1	AY
2- 9	RC-HZA195JBE0	Fan motor capacitor	1	AL
2-10	RTHM-A296JBE0	Thermistor	1	AN
2-11	LHLD-A190JBFO	Thermistor holder	1	AG
2-12	PBOX-A149JBFO	Control box	1	AN
2-13	HPNLCA497JBFO	Control box cover	1	AF
2-14	HPNLCA616JBEO	Control panel	1	AE
2-15	LHLD-A266JBFO	Cord holder	1	AE
2-16	LHLD-A265JBFO	Cord clamp	1	AC
2-17	TLABCB254JBR0	Wiring diagram	1	AC
2-18	PSHE-A076JBE0	Protection cover	1	AE
2-19	PGUMMA095JBE0	Wire cushion	1	AA
2-20	PCOV-A191JBE0	LED holder	1	AD
2-21	RH-IXA519JBE0	Microcomputer (IC1)	1	AX
2-22	RH-IZA149JBE0	Integrated circuit (IC2)	1	AE
2-23	RIC--A022BDE0	Integrated circuit (IC3)	1	AE
2-24	RIC--A025BDE0	Integrated circuit (IC4)	1	AE
2-25	RH-IZA140JBE0	Integrated circuit (IC5)	1	AE
2-26	RH-IZA337DRE0	EEPROM (IC6)	1	AK
2-27	VHRS201D01/-6	Solid state relay(SSR)	1	AK
2-28	RRLYJA067JBE0	Relay (RY)	1	AP
2-29	RFIL-A042JBE0	Coil (L)	1	AM

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
2-30	RH-VZA025JBE0	Varistor (NR)	1	AD
2-31	RC-QZA096JBE0	Capacitor (C1)	1	AE
2-32	RTRN-A181JBE0	Current transformer(CT)	1	AN
2-33	RH-VZA020JBE0	Varistor (CNR1, CNR2)	2	AE
2-34	RRLYJA059JBE0	Relay (RY2, RY3)	2	AN

**CYCLE PARTS**

3- 1	CPIPCA612JBK0	Pipe assembly	1	AZ
3- 2	PEVA-A244JBE0	Evaporator	1	BS

**ACCESSORY PARTS**

4- 1	LX-NZ0247JBE0	Wall plug, fixing Mounting plate	7	AB
4- 2	XTTSD45P30000	Screw for Wall plug	6	AA
4- 3	CRMC-A489JBE0	Wireless remote controller	1	BG
4- 4	LX-BZA106JBE0	Special screw	1	AD
4- 5	TINS-A563JBR0	Installation manual	1	AD
4- 6	TINSEA220JBR0	Operation manual	1	AP
4- 7	PPLTNA022JBP0	Mounting plate	1	AL
4- 8	TINS-A564JBR0	Installation manual	1	AD
4- 9	FCOV-A013JBFS	Screw cover	2	AC
4-10	LPFT-A022JBF0	Drain joint	1	AD

**SCREWS AND RING**

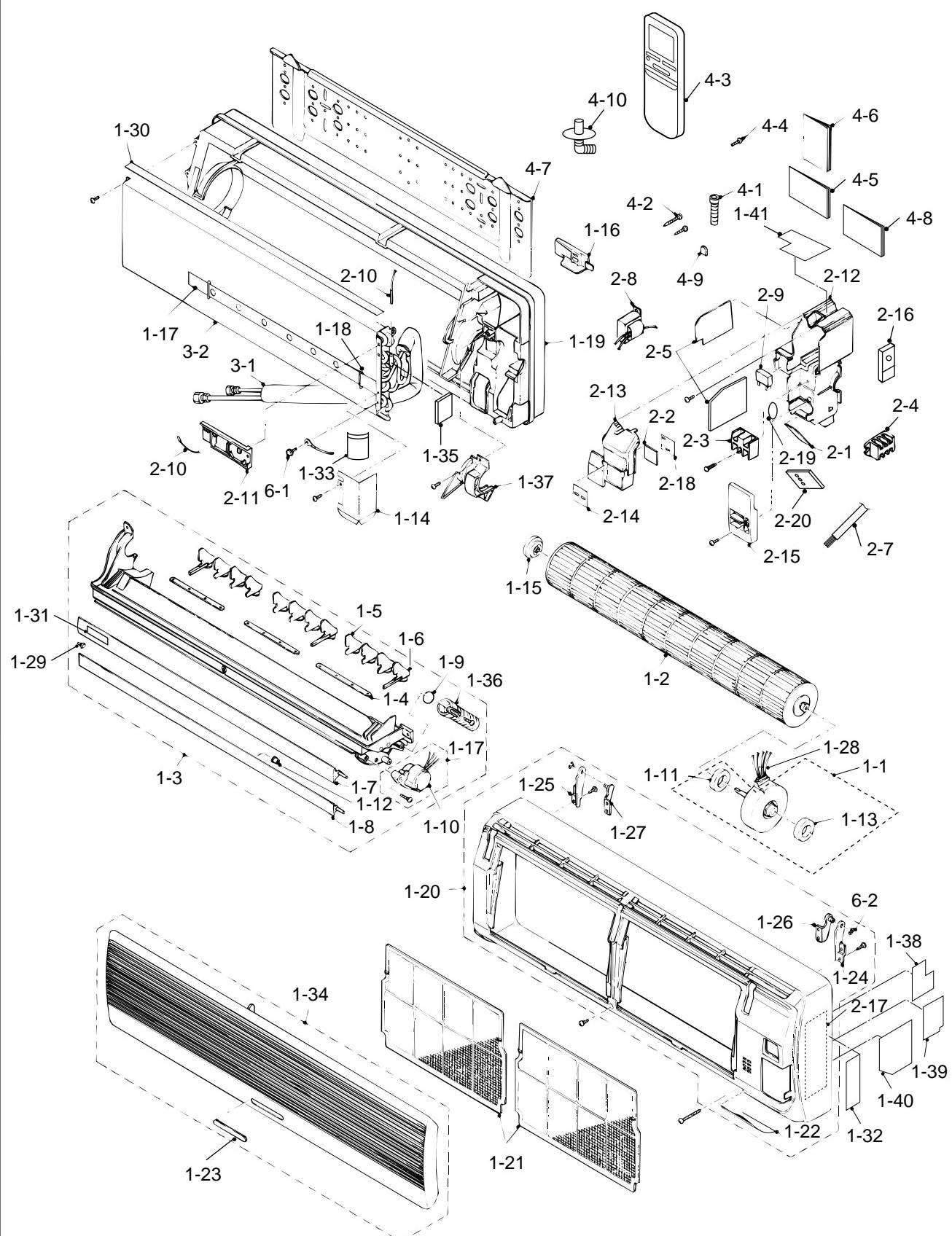
6- 1	LX-BZA075JBE0	Special screw	1	AA
6- 2	XREUW50-06000	Ring	2	AA

**HOW TO ORDER REPLACEMENT PARTS**

To have your order filled promptly and correctly, please furnish the following information.

- |                 |                |
|-----------------|----------------|
| 1. MODEL NUMBER | 2. REF. NO.    |
| 3. PART NO.     | 4. DESCRIPTION |

INDOOR UNIT FOR AY-A079E AND AY-A099E



**REPLACEMENT PARTS LIST [AE-A079E/AE-A099E]**

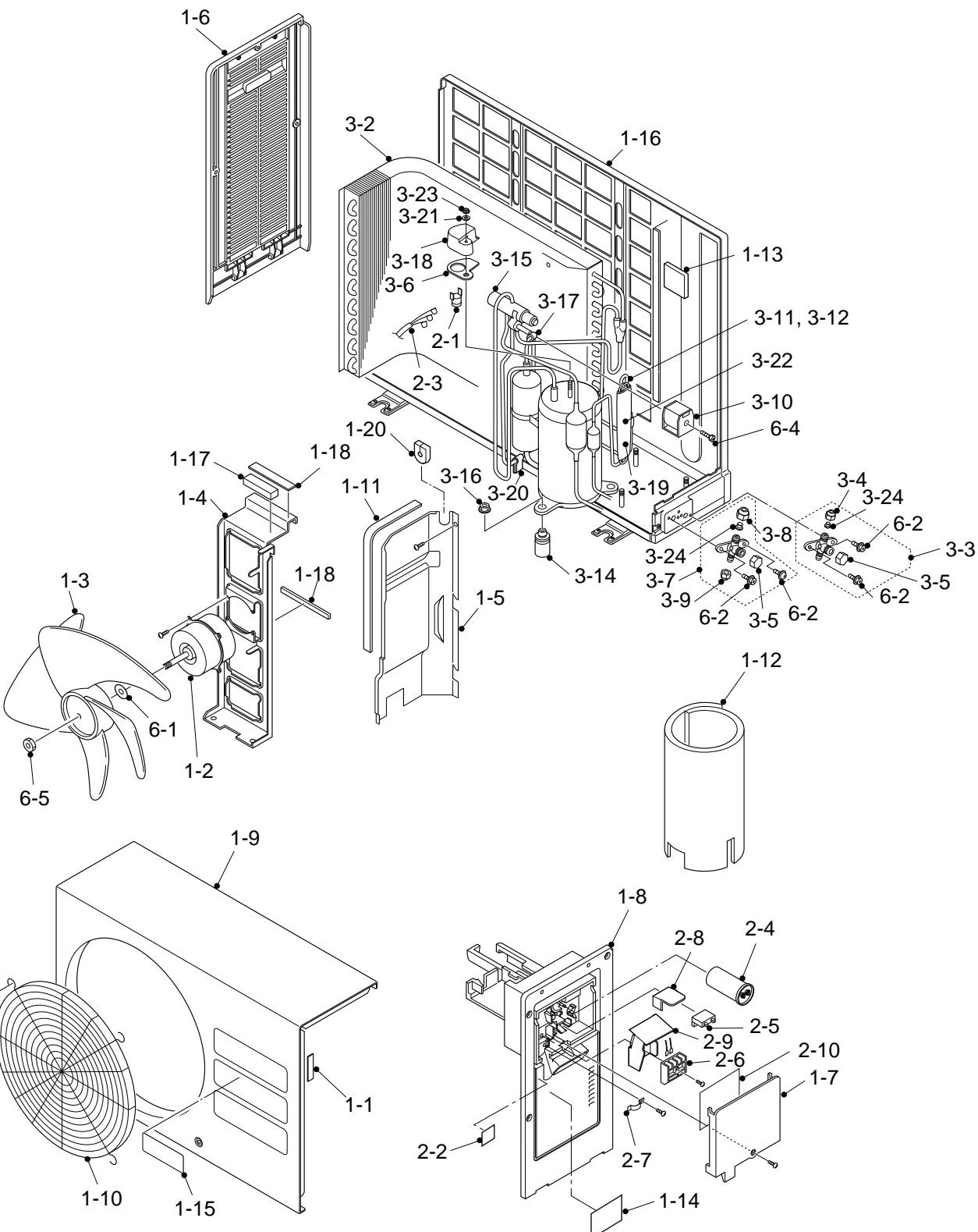
REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
<b>CABINET AND UNIT PARTS</b>				
1- 1	PSEL-A345JBE0	Cabinet seal	1	AK
1- 2	CMOTLA592JBE0	Fan motor	1	BP
1- 3	NFANPA020JBEA	Propeller fan	1	AW
1- 4	PANGKA018JBP0	Fan motor angle	1	AP
1- 5	PSKR-0106JBP0	Bulkhead	1	AM
1- 6	GPLTPA014JBFA	Left side cover	1	AR
1- 7	GFTA-A387JBF0	Terminal cover	1	AH
1- 8	GBOX-A004JBFA	Right side cover	1	AS
1- 9	GCAB-A105JBTB	Cabinet	1	BA
1-10	GGADFA030JBEA	Fan guard	1	AY
1-11	PSEL-A346JBE0	Bulkhead seal	1	AK
1-12	PSPF-A430JBE0	Compressor cover [AE-A079E]	1	AV
1-12	PSPF-A692JBE0	Compressor cover [AE-A099E]	1	AY
1-13	PGUMSA202JBE0	Damper rubber [AE-A079E only]	1	AE
1-14	TSPC-C958JBR0	Name label [AE-A079E]	1	AD
1-14	TSPC-C957JBR0	Name label [AE-A099E]	1	AE
1-15	TLABBA029JBR0	SHARP badge	1	AD
1-16	CCHS-A464JBTB	Base pan assembly [AE-A079E]	1	BF
1-16	CCHS-A636JBTB	Base pan assembly [AE-A099E]	1	BF
1-17	PSPF-A277JBE0	Angle seal	1	AK
1-18	PSEL-A347JBE0	Angle seal	2	AK
1-19	PSEL-A344JBE0	Condenser seal	1	AK
1-20	LBSHCA022JBF0	Bushing	1	AE
<b>CONTROL BOX PARTS</b>				
2- 1	RHOG-A107JBE0	Protector [AE-A079E]	1	AX
2- 2	TLABPA182JBE0	Badge	1	AC
2- 3	CW-VZA208JBK0	C wire sub assembly [AE-A079E]	1	AR
2- 3	QW-VZD438JBE0	C wire sub assembly [AE-A099E]	1	AQ
2- 4	RC-HZA316JBE0	Running capacitor	1	AY
2- 5	RC-HZA071JBE0	Fan motor capacitor	1	AH
2- 6	QTAN-A145JBE0	Terminal board	1	AQ
2- 7	LHLD-0261JBM0	Cord holder	1	AB
2- 8	PCOV-A455JBP0	Capacitor cover	1	AF
2- 9	PCOV-A471JBP0	Terminal cover	1	AR
2-10	TLABC662JBR0	Wiring diagram [AE-A079E]	1	AB
2-10	TLABC152JBR0	Wiring diagram [AE-A099E]	1	AC
<b>CYCLE PARTS</b>				
3- 1	PCMPRA177JBE0	Compressor [AE-A079E]	1	CM
3- 1	PCMPRA289JBE0	Compressor [AE-A099E]	1	CG
3- 2	PCON-A263JBP0	Condenser [AE-A079E]	1	BY
3- 2	PCON-A407JBP0	Condenser [AE-A099E]	1	BY
3- 3	DVLV-A189JBK0	2 Way valve assembly	1	BA
3- 4	PSEN-A004JBK0	Flare nut assembly 1/4"	1	AE
3- 5	LX-NZA033JBE0	Valve cap	2	AF
3- 6	PSEL-A006JBE0	Terminal gasket [AE-A079E]	1	AC
3- 6	PSEL-B172JBE0	Terminal gasket [AE-A099E]	1	AD
3- 7	DVLV-A212JBK0	3 way valve unit	1	BB
3- 8	PSEN-A005JBK0	Flare nut assembly 3/8"	1	AG
3- 9	LX-NZA034JBE0	Service cap	1	AD
3-10	CCIL-A064JBK0	Reverse valve coil assembly	1	AW
3-11	PCPY-A281JBE0	Capillary tube [AE-A079E]	1	AP
3-11	PCPY-A665JB10	Capillary tube [AE-A099E]	1	AH
3-12	PCPY-A282JBE0	Capillary tube [AE-A079E]	1	AN
3-12	PCPY-A666JB10	Capillary tube [AE-A099E]	1	AG
3-13	PSRN-A040JBE0	Strainer	1	AN
3-14	GLEG-A073JBE0	Compressor cushion [AE-A079E]	3	AD
3-15	PVLVXA009JBE0	Reverse valve	1	BE
3-16	LX-NZA028JBE0	Special nut	3	AB
3-17	PGUMS0147JBE0	Damper rubber	1	AE
3-18	PCOV-A002JBE0	Terminal cover [AE-A079E]	1	AE
3-18	PCOV-A378JBE0	Terminal cover [AE-A099E]	1	AH
3-19	PVLVC0353JBE0	Check valve [AE-A079E]	1	AK
3-19	PPIPCB449JBE0	Check valve [AE-A099E]	1	AM
3-20	PGUMSA033JBE0	Damper rubber [AE-A099E]	1	AH
3-21	PSEL-B722JBE0	Rubber washer [AE-A099E]	1	AE
3-22	PGUMS0227JBE0	Damper rubber [AE-A079E]	1	AF
3-22	PGUMSA234JBE0	Damper rubber [AE-A099E]	1	AK
3-23	LX-NZA002JBE0	Special nut [AE-A079E]	1	AA
3-23	LX-NZA051JBE0	Special nut [AE-A099E]	1	AH
3-24	LX-NZA081JBE0	Bonnet	2	AG

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
<b>SCREWS, NUT AND WASHER</b>				
6- 1	LX-WZA019JBE0	Special washer	1	AB
6- 2	LX-BZA078JBE0	Special screw	3	AB
6- 3	LX-BZA075JBE0	Special screw	1	AA
6- 4	LX-BZA127JBE0	Special screw	1	AC
6- 5	LX-NZA030JBE0	Special nut	1	AB
6- 6	LX-CZA038JBE0	Special screw	2	AB
6- 7	LX-BZA076JBE0	Special screw	4	AA
6- 8	XTTUW40P16000	Tapping screw	2	AB

**HOW TO ORDER REPLACEMENT PARTS**

- |                 |                |
|-----------------|----------------|
| 1. MODEL NUMBER | 2. REF. NO.    |
| 3. PART NO.     | 4. DESCRIPTION |

#### OUTDOOR UNIT FOR AE-A079E AND AE-A099E





**SHARP**